Aalto University
School of Business

EFFECTS OF HEALTHCARE REFORM ON MARKET STRUCTURE AND COMPETITION DYNAMICS

Master's Thesis

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Spring 2018

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Abstract of master's thesis

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Title of thesis Effects of Healthcare Reform on Market Structure and Competition Dynamics

Degree Master of Science

Degree programme Economics

Thesis advisor Otto Toivanen

Year of approval 2018 **Number of pages** 71 **Language** English

Abstract

This thesis examines the effects of the introduction of choice and competition in primary care on the Finnish healthcare market. The purpose of the thesis is to evaluate how the implementation of the healthcare reform and consumers' freedom of choice are going to change the market structure and competition dynamics. The theoretical framework of the thesis consists of the opening of markets to regulated competition, the shift of production from public to private ownership, and government producer price-controlled markets.

Finnish healthcare is being taken in a more cost-efficient direction which, at the same time, also increases the importance of private companies. The aim of the planned reform is to increase competition and to enhance services to meet the needs of the consumers both in terms of accessibility and consumer choice. The preparation for the reform has not been unproblematic since there is no single model that could simultaneously be optimal for consumers, companies, and the government. The regional differences of Finland will bring their own challenges to the management of the service network and for the opening of the market. Economic models do not provide simple and easy solutions that would guarantee an efficient outcome for all markets.

Finland's geographically fragmented healthcare demand provides a challenge for setting up a comprehensive producer network, endangering the consumers' freedom of choice. According to the evidence from other Nordic countries, competition is focused on cities, often leaving sparsely populated areas for less attention. The opening of the healthcare sector to competition has been shown to increase the consumption of health services. In areas of low demand, markets are more concentrated and this has been shown to deteriorate the quality of service. In areas of high demand, e.g., cities, competition between producers is more intense. Due to competition, companies that are able to deliver the service most economically and efficiently persist in the market.

The structure of the producer network is largely driven by the compensation scheme that provides the reimbursement for treatments provided. However, every compensation scheme has its own risks. In fixed compensation, there is the risk that producers will try to select the least expensive customers. The variable compensation system, which is linked to the service output level, on the other hand, encourages overproduction where production is inefficient and the producer market becomes costly for the government. Since regional differences in Finland are large, it is not optimal to use just one compensation system or a model.

Inadequate production network and lack of competition are inevitably going to be problematic topics in Finland. Distances are long in sparsely populated areas but travelling times may also increase in larger cities. In addition to competition, market structures are influenced by how consumers are going to select their healthcare provider.

Keywords health economics, opening of markets, healthcare reform, competition, market structure, capitation, quasi-markets

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Maisterintutkinnon tutkielman tiivistelmä

Tekijä Marita Koskinen

Työn nimi Effects of Healthcare Reform on Market Structure and Competition Dynamics

Tutkinto Kauppatieteiden maisteri

Koulutusohjelma Economics

Työn ohjaaja Otto Toivanen

Hyväksymisvuosi 2018 **Sivumäärä** 71 **Kieli** englanti

Tiivistelmä

Tutkimuksen tarkoituksena on arvioida kuinka terveydenhoitouudistus ja kuluttajan valinnanvapaus vaikuttavat markkinarakenteeseen ja kilpailudynamiikkaan. Työn teoreettisina näkökulmina ovat markkinoiden avautuminen säännellylle kilpailulle, tuotannon siirtyminen yksityiseen omistukseen ja valtion tuottajahintojen ohjailema markkinatilanne.

Suomen terveydenhuoltoa pyritään viemään kustannustehokkaampaan suuntaan, joka samalla lisäisi yksityisten yritysten merkitystä markkinoilla. Tavoitteena on lisätä kilpailua ja saada palvelun tarjonta paremmin vastaamaan asiakkaiden tarpeita niin palvelun saatavuuden kuin kuluttajien valinnanvapaudenkin muodossa. Uudistuksen valmistelu ei ole ollut ongelmatonta, sillä ei ole olemassa yhtä ainoaa mallia, joka voisi samanaikaisesti olla optimaalinen niin kuluttajille, yrityksille kuin hallitukselleKin. Suomen alueelliset eroavaisuudet asettavat myös omat haasteensa tuotannon suunnittelulle ja markkinoiden avaamiselle. Myöskään taloustieteelliset mallit eivät suoraan tarjoa yksinkertaisia ja helppoja ratkaisuja, jotka takaisivat tehokkaat markkinat.

Suomen maantieteellisesti hajautunut kysyntä luo haasteen kattavan tuottajaverkoston luomiselle sekä uhkaa kuluttajan valinnanvapauden toteutumista. Muista pohjoismaista saatujen tulosten perusteella kilpailu keskittyy keskuksiin ja kaupunkeihin ja haja-asutusalueet jäävät pienemmälle huomiolle. Terveydenhoitoalan avaamisen kilpailulle on nähty lisäävän terveyspalveluiden kulutusta. Alhaisen kysynnän alueilla markkinat ovat keskittyneemmät, minkä on nähty heikentävän palvelun laatua. Suuren kysynnän alueilla, esimerkiksi kaupungeissa, tuottajien välinen kilpailu on kovempaa. Kilpailun ansiosta markkinoille jäävät ne yritykset, jotka pystyvät tuottamaan palvelun edullisimmin ja tehokkaimmin.

Tuottajaverkoston muodostumista ohjaa suurelta osin korvausjärjestelmä, jonka perustella tuottajille maksetaan korvaus tarjotusta hoidosta. Korvausjärjestelmissä on kuitenkin omat riskinsä. Kiinteässä korvausjärjestelmässä riskinä on, että tuottajat pystyvät valikoimaan itselleen edullisimmat asiakkaat. Palvelutasoon sidottu muuttuva korvausjärjestelmä puolestaan kannustaa ylituotantoon, jolloin tuotanto ei ole tehokasta ja tuottajamarkkinoista tulee julkishallinnolle kallis. Koska Suomessa alueelliset erot ovat suuret, ei ole optimaalista käyttää vain yhtä korvausjärjestelmää tai korvausjärjestelmämallia.

Riittämätön tuotantoverkosto ja kilpailun puute tulevat väistämättä olemaan Suomen terveydenhuollon ongelmakohtia. Harvaan asutuilla alueilla etäisyydet ovat pitkiä, mutta matka-ajat voivat kasvaa myös suuremmissa kaupungeissa. Kilpailun lisäksi markkinarakenteisiin vaikuttaa se, miten kuluttajat valitsevat terveydenhuollon tuottajansa.

Avainsanat terveystaloustiede, markkinoiden avautuminen, terveydenhoitouudistus, kilpailu, markkinarakenne, kapitaatio , kvasimarkkinat

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1. Introduction

Finland is a welfare country in all the meanings of the word. Its infant mortality rates are some of the lowest, and lifetime expectancies some of the highest, in the OECD (2017). The health of the population has generally improved thanks to public healthcare, and many diseases have disappeared from the country.

Finland is known for its high-quality healthcare, but when it comes to accessibility and efficiency, public healthcare has been in poor state for decades. Currently, the Finnish healthcare system is facing challenges related to excessively long waiting times and patient dissatisfaction. At the same time, the government is trying to reduce ever-increasing healthcare costs. In an attempt to improve access and generate more patient-centred healthcare, Finland is about to implement a healthcare reform. Since public healthcare is considered as one of the most important pillars of a welfare country, there will be several challenges in executing the reform.

The reform allows consumers to choose their healthcare provider. As consumers may choose between public, private, and third-sector (i.e., non-profit organisation) providers, the reform is likely to influence demand and consumption. The purpose of the thesis is to evaluate how the implementation of the healthcare reform affects the overall market structure and competition. The objective is to theoretically investigate how changes in competition affect the dynamics between producers. The thesis is based on existing theoretical and empirical analyses.

This thesis explains how the opening of the healthcare market affects private producers; namely, the competition. More specifically, the research questions are:

1. How does the market structure change when the healthcare market is opened to private companies?
2. How does private healthcare supply change when compensation payments are changed?
3. How do regional population densities affect the distribution of private medical centres?

I shall go through key literature on the effects of competition in a quasi-market system; effects of consumer choice on the relative position of companies in the market; and how the change in the market framework, the opening of markets in particular, affects producers.

In the literature review, I shall address current research on the effects of healthcare reform. To understand how the market works, it has to be acknowledged that the market is specific to the healthcare industry. Healthcare market has been described as irregular and unpredictable relative to conventional competitive markets (Arrow 1963). The general risk level, the uneven distribution of information between the customer and the service provider, and the uncertainty of the outcome of the service create special conditions for the healthcare market. It is also significant that the need for health services cannot be reliably predicted on the individual level. There may be differences between customers, as well: well-informed patients may be able to demand a particular treatment, and this may lead to differences in treatments and inequality between patients (Hanoch and Rice 2011). When the consumer is allowed to choose the provider, this creates incentives for companies to concentrate more on quality and efficiency (Enthoven and Tollen 2005; Le Grand 2009). It should be noted, however, that consumers cannot truly compare the quality of service if they cannot assess the practitioner's qualification. I shall also address healthcare privatisation across Europe, and in the Nordic countries in particular. More specifically, the focus will be on privatisation and its impact on the market.

In Europe, the role of public healthcare increased significantly in the 20th century, yet the share of healthcare spending already began to waver in the 1980s when many countries began to privatise certain parts of their healthcare system while reducing the government's role. In the 1990s, the role of the private sector in healthcare services was increased in France and in Germany to correct the shortcomings of the public sector. (Maarse 2006.) Apart from Finland, Sweden and the United Kingdom have been more reluctant to make a shift from governmental healthcare, and they only recently began to offer healthcare services through the private sector. According to results obtained from Sweden, new private producers emerged, particularly in large cities, shifting the share of production from public producers to private companies (Anell 2011).

The theoretical part of the thesis presents general information about opening of the markets and its effects on competition. Due to the regulation of the sector and the high initial capital cost, healthcare market has a "natural" barrier to entry. Consumer inactivity protects inefficient producers on the market. Activity requires good information on the services, as well as consumers' ability to make comparisons between producers. In addition to entry, effective quasi-market also allows exit. If a healthcare provider fails in quality, or does not meet customer needs, it should be allowed to go (Le Grand 2009). In the Finnish reform, regions[1] are obligated to monitor providers' capabilities.

In addition to the theoretical examination and the literature review, I shall provide a complementary empirical part. The purpose of the empirical analysis is to demonstrate the effects of market opening on competition. Based on the literature review and theory, I shall examine how, e.g., capitation and producer size change the market outcome.

It can be assumed that a perfectly functioning market structure, set by the theory, cannot be created in Finland. Based on the theory, the best outcome is achieved when there are enough options for the consumers, i.e., there is sufficient competition. Customers can then choose between several providers and pick the one they think offers the best service. On the Finnish scale, however, this outcome is not possible – at least, not in the more sparsely populated areas. In the next section, I shall provide an overview of the Finnish healthcare system. Section 3 outlines the theoretical framework for the opening of the market and provides a literature review about competition in healthcare markets. Section 4 examines healthcare reforms in European countries, and section 5 acknowledges the challenges to the Finnish reform. The empirical study is presented in section 6, followed by a discussion in section 7. Section 8 concludes the paper.

[1] region = *maakunta* (in Finnish) / *landskap* (in Swedish). Finland is currently divided into 19 regions, of which 18 participate in the healthcare reform (the autonomous region of Aland Islands is excluded).

2. Background

From the perspective of healthcare reform, the Finnish market consists of demographically very different types of areas. Therefore, it can be assumed that market dynamics and competition operate differently in growth centres and in sparsely populated areas. The characteristics of the regional market have an important impact on the type of producer structure that will be created in the area. Presumably, sparsely populated areas cannot have as rich a variety of producers as cities. It is highly probable that there will be areas with just one producer. In sparsely populated areas, the market structure may favour a natural monopoly where the local market can only accommodate one producer. If several producers shared this market, the ratio of customers per producer would become inefficiently small. This could make production more expensive, and markets more fragmented.

2.1. Challenges in Finnish Healthcare

The main challenge for Finnish healthcare is the aging population, along with age-related health problems. By the mid-1970s, the share of the over 65-years-old in the Finnish population exceeded the OECD average. In the over 80-years-old segment, the average was topped in the 1980s. Since the mid-1990s, the share of people over 80 has grown faster than the average of OECD countries. At the beginning of the 2000s, the share of people over 65 grew steadily, and their share of the population has been increasing faster than in other Nordic countries. In 2010, this trend intensified further. While the share of the aging population has increased in OECD countries, the change has been significantly faster in Finland. In 2013, the share of those over 65 in Finland already topped that in Sweden, and, in the 2010s, approximately 20 % of Finland's population has been over 65. (OECD 2017.)

The number of medical consultations per population in Finland is on the same level as in Denmark and Norway. In general, people make fewer medical visits in the Nordic countries than in the other OECD countries. In the 2000s, healthcare costs relative to gross domestic product have been largely in line with the other OECD countries, but increasing steadily. Before 2005, the share of healthcare costs stayed slightly below the OECD average, but since 2009 it has lingered above the average. In Sweden, the share of total

healthcare costs of gross domestic product increased significantly between 2010 and 2011, from 8.5 % to 10.7 %. This change was mainly due to an increase in public sector costs. Measured in current prices, the relative change was about 30 %, i.e., approximately 26 % above the average cost increase. There is no noticeable increase in healthcare costs in Norway, though. (OECD 2017.) OECD also provides data for comparisons about healthcare efficiency and quality, but there are no universally accepted definitions or measurement methods.

A Finnish survey (Kapilainen et al. 2010) finds that a significant part of the costs in healthcare comes from the care of very expensive patients. The patient is defined as very expensive if the person's treatment costs during a year exceed one of two thresholds: 75 000 (class I), or 50 000 euros (class II). The majority of costs from metropolitan areas consists of special care, elderly care, and primary care. The highest cost item for very expensive patients (class I) was psychiatric ward. While mental illness was the most significant cost factor, other major factors include the care of dementia, diabetes, asthma, depression, Parkinson's disease, heart failure, cancer, and hypertension.

In 2015, the largest share of healthcare expenditure came from specialised healthcare (34 %), while primary healthcare was the second largest expenditure item (18.6 %). Between 2000 and 2015, the share of specialised healthcare increased slightly (by about 2 percentage points) and the share of primary healthcare decreased (by 3.5 percentage points). (THL 2017.)

2.2. Structure and Financing of Finnish Primary Care

In Finland, primary care is produced by private enterprises, municipalities, and hospital districts. The structure of the Finnish healthcare system is geographically highly decentralised. After the reform, the government would only be responsible for key policy decisions in healthcare, while the 18 regions would take the responsibility for organising, providing, and financing the services. All Finnish residents are covered by public health insurance, but the citizens' confidence in the adequacy of statutory social security as a safeguard for well-being is not very strong. Hence, in June 2017, Finns had over 1.1 million private insurances, of which approximately 40 % were insurances for children and almost 43 % were private insurances for adults (Finanssialan Keskusliitto 2018).

Additionally, a part of the population is offered employer-provided occupational healthcare services, and over 80 % of wage-earners are covered by occupational healthcare services. Approximately 60 % of them use private medical centres, and just under 23 % rely on a public health centre. The remaining 17 % use the employer's own health centre or jointly maintained health centres. (SVT 2018.) 3.7 million citizens around Finland remain outside occupational healthcare.

Occupational healthcare and customer payments generate only a small part of the incomes that make public primary care possible; the main income comes from general tax revenues. At the beginning of the 2000s, approximately 3 % of government expenditures were generated from municipal primary healthcare services, purchased from the private sector. Costs increased from about 100 million in the early 2000s to over 210 million in 2010. Despite the general increase in costs, the share of purchases made from the private sector also increased – by about 7 percentage points from 2010 to 2015. (THL 2017.) One of the objectives for the healthcare reform is a reduction in costs through efficiency increases resulting from competition and digitalisation. The cost reduction goal can only be achieved by improving productivity: the number of healthcare facilities must be reduced, and the hospital network must be renewed. Almost 60 % of healthcare costs, generated in municipalities, are labour costs. Hence, the volume of service should be decreased. (Pöysti 2015.) Even if the productivity of the public sector could be increased, e.g., by increasing the workload for doctors, this would hardly increase the health of the patients. When considering efficiency, attention should be paid to patient safety and the effect of treatments.

2.3. Freedom of Choice Law

The process for increasing freedom of choice in healthcare dates back to 2014 when patients were first offered the option to choose a healthcare centre and a specialised healthcare unit amongst all public centres in Finland. Government's extension of freedom of choice continued in 2015 when the general principles for an even broader freedom of choice were outlined. The new freedom of choice law, whereby each consumer can directly choose their own primary healthcare provider from a private, a public, or a third sector producer, is expected to come into force in 2020 (LFC 2017).

Prior to the completion of the law, there have been great concerns about its viability. In practice, the first steps will be taken at the end of year 2019 when regions inform their residents of the procedures for selecting the producer, and the residents begin to register themselves. The key aspects of the proposed law, as regards primary healthcare, include:

1. The consumer has the freedom to choose their primary healthcare centre from those approved as service producers in the region;
2. Primary care providers that meet statutory and regional requirements may apply to become service providers;
3. Regions must ensure fair competition between public and private providers;
4. Regions have an obligation to provide monetary compensation to each producer chosen by the consumer; compensation to the service provider must encourage efficient services and promote health of the population. (LFC 2017.)

In addition, residents can get a voucher, issued by the region, to supplement social and health services, such as home care or disability care (DSFC 2017). The law does not provide specific guidance on the implementation of the reform. Instead, regions are given autonomy to plan their own production and to determine the amount of compensation. Mostly, the law sets out the principles and requirements that regions must follow in order to secure the care. Each region decides their service providers and the fixed compensation fee that is paid for each registered customer independently. Compensation is mainly based on capitation[2], which is determined by the number of patients and their factors of need, in turn derived from their age, gender, and general health. Customer fees are the same for all operators approved by the region. Therefore, competition is based on the quality and accessibility of the service. (LFC 2017.)

The law allows private healthcare companies an opportunity to increase their market share through new consumer segments by applying to become a service provider. Since private companies have been considered as expensive and out of reach for low-income consumers, the reform will make them better accessible for all. The law on freedom of choice will inevitably increase competition. The customers' freedom to replace a service provider brings the healthcare sector closer to perfect competition. In addition to increasing competition, the law on freedom of choice is seen to improve the functioning of the market

[2] Capitation is a fixed compensation that the region pays monthly or yearly to the service producer. It can vary based on customer characteristics, or be same for all residents in the region.

and the allocation of financial resources (Ahonen et al. 2015). The market functions more efficiently when the supply is targeted at demand rather than determined based on political or administrative views.

2.4. Compensation System

Compensation is decided by each region independently, and criteria for compensation are the same for all producers regardless of whether they are private, public, or third sector producers (LFC 2017). Compensation falls into two categories: fixed capitation fee and variable fee-for-service. In addition to these, producers also receive a nominal customer payment. Regions are required to make a capitation payment, but they are free to decide whether to provide an additional fee-for-service type compensation. Healthcare centres may receive up to a third of their compensation through governmental fee-for-service payments, paid based on services provided. Compensation can be paid, e.g., for the completion of an individual operation. By including morbidity, which is related to consumer characteristics, this payment model promotes consumer-specific consideration among producers and helps in allocating the costs. Payments can then be allocated more fairly even when some producers have relatively large numbers of patients who require a lot of care. Each region is given discretion to decide the share of fixed compensation, as well as the amounts of payments. (DSFC 2017.) A small capitation payment gives room to manoeuvre with the fee-for-service payment, reducing the risk of paying for customers who only rarely use healthcare services. The more the compensation is based on fee-for-service payments, the more equitably the compensation system takes into account regional differences in morbidity.

The impact of freedom of choice on private companies can be evaluated using the costs government currently pays for healthcare. In the healthcare reform, the government is also going to revise its healthcare subsidies to public providers. The government's subsidies determine how much governmental money the municipality receives for organising basic municipal services. The current subsidy system does not take into account all factors affecting the cost of healthcare, and the system therefore needs to be revised to meet the requirements of the reform (Vaalavuo et al. 2013). The burden of healthcare costs is unevenly distributed across municipalities (Tilastokeskus 2017). The subsidy system gives an indication of how public healthcare has been funded and, possibly also, what kind of

costs may ensue from the diseases of the population. The highest costs per resident are found in northern Finland, coinciding with the lowest population densities in the country (Figure 1). Municipalities with the lowest costs, on the other hand, are located in the west and in the south.

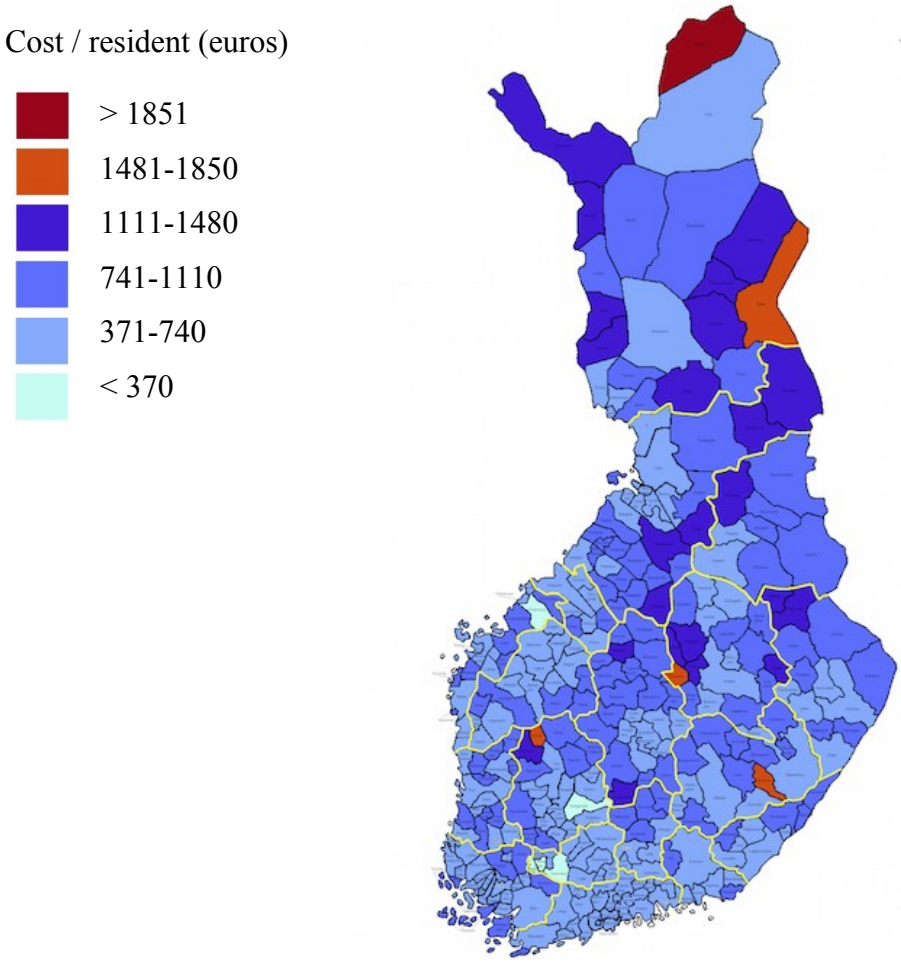

Figure 1. Primary healthcare cost per resident in Finnish municipalities in 2016 (data from Tilastokeskus 2017).

A previous study has determined the factors that would be the best for explaining the costs of treatment and how alternative models would work at the municipal level. The study also attempted to find weights for the factors used in explaining municipal healthcare expenditures. In general, age and gender are considered as the primary criteria for assessing the need for a healthcare cost, even though they poorly explain both the cost and cost variation in healthcare. There are no significant differences in the cost structures between women and men. The only difference is due to labour, which increases the costs

for women. In 2006, the year examined, the average cost of healthcare was 1240 euros per person. (Häkkinen et al. 2009.) The largest cost weights were given to mental illnesses, cancers, dementia, and care for over 85-year-olds (Häkkinen et al 2009: Vaalavuo et al. 2013: compare Kapilainen et al. 2010).

Apart from individual illnesses, disability pensions of under 55-years-olds are among the most significant factors driving up healthcare costs. Of socio-economic factors, the lack of education and senior citizens living alone are the main indicators for high costs. The new subsidy model should better take into account socio-economic factors. The revised system would even out differences between municipalities and take into consideration the financial burden of lower social classes. (Vaalavuo et al. 2013.)

3. Introducing Competition and Opening of Markets

The opening of markets and how market opening affects customers' choices is the core theme of this thesis. The outcome of a market opening is significantly affected by industry, time, politics, characteristics of the country, technological development, and numerous other things that make each market opening unique. The opening of a market creates a new competitive environment and allows new entries. New entrants are a threat to incumbents, but they can bring better accessibility and more advanced services for customers. While the opening of a market is an opportunity for increasing market power, it is also a threat that, at worst, may drive some of the companies out of the market. The next subsection highlights the theory of market opening, and the one after that dives into empirical studies.

3.1. Opening of Markets

Government's participation in economy is most explicit in production that is under public ownership. Justification for government's ownership comes through costs: it is not sensible to use government's money in private companies' production where the government cannot control the costs or affect the entity's activities. The general argument for maintaining production and services on the public side is that production can be unprofitable for private companies, and the public sector is the only one capable of producing the service in question. This argument does not, in itself, apply because the government can, through negotiations, always order companies to operate nationwide (Shleifer 1998). Companies operating in financially challenging areas can be compensated to reduce the difference in expected profits between different areas.

Before the opening of the market, production is driven by laws and norms and protected from competition. It is then subjected to market forces. This chain of events reforms the institutional framework of the industry. New companies can enter the market either by producing the same product or service that the market previously had, or by producing new products or services for market segments that had been excluded earlier. For the market opening to be successful, it is essential that companies in the industry respond to the change and change their own business processes and organisation structure. The opening of markets, therefore, calls for measures from companies, but it is often perceived that the actions of private companies are the most effective. Consequently, the fact that

governments are inefficient providers of goods and services is the most pressing argument for opening the market for private companies: the key reasons for this change are productivity and efficiency improvements. Theorists (Vickers and Yarrow 1991; Shleifer 1998; Cuervo and Villalonga 2000) agree that privatisation and the resulting increase in competition improve the efficiency of companies and reduce costs, while still providing services the society needs. Based on this, profit-seeking companies operate better and cheaper than the public sector. Public ownership is not inherently less efficient than private ownership: competition, rather than the form of ownership, is crucial for efficiency.

In privatisation, production rights are transferred from public to private ownership. If the opening of the market is implemented through deregulation, this reduces governmental control in the industry and increases competition by facilitating access to markets. Market opening does not, in itself, mean reduction in regulation. The government may avoid harmful market conditions by regulating the market and thereby prevent discriminatory behaviour by companies. Regulations and contractual terms can lead to a situation where there is only a small difference between public and private production. However, the benefits of the market opening are linked to competition in the industry, liberalisation, and deregulation (Vickers and Yarrow 1991). Shleifer's (1998) discussion of the differences of private and public sectors culminates in the statement that an innovative and efficient private company can better achieve cost benefits than the public sector. In contrast to the public sector, it also has an incentive to be innovative as it can achieve higher profits through cost savings and by reducing economic inefficiencies. A private company does not need to share its innovations with other companies, and its organisational structure is often more agile than that of the public sector. Innovations can then be taken into use faster.

A problem with privatisation is that, for private companies, the incentive for cost reduction may be too high. The public sector does not share a similar need to minimise costs. Of course, in order to effectively compete in the market, the private company cannot reduce its cost if the resultant quality decrease leads to it losing its customers. (Shleifer 1998.) As the market opens to competition, the consumer reaction can boost the efficiency of the marketing efforts of companies. A company with a large market share and a lot of capital, e.g., for advertising, can be more effective in gaining customers. This can strengthen the position of a dominant company that is able to make better use of its marketing operations and former reputation. Smaller companies may need to spend more funds to achieve the

same effect and maintain their market position. The asymmetry of competition arises from the characteristics of companies that can, to some extent, protect them from competition. A dominant company can, for example, offer services that smaller companies are not able to provide: competition for customers is not necessarily fair.

The opening of the market may also occur in a place where there only was a government monopoly before. In this case, the producer market is created from scratch. Armstrong and Sappington (2006) compared competitive markets with regulated monopolies and concluded that while a regulated monopoly offers the opportunity to control prices, freely competing companies may have lower marginal costs. The advantages of a regulated monopoly are direct payment channels and economies of scale, while the absence of regulatory costs gives the competitive market a cost advantage. Despite the advantages of the monopoly market, it does have a higher deadweight loss, i.e., lower welfare, than any other market form.

Opening the market can be considered to take place in the three dimensions mentioned earlier: shift from public ownership to private ownership (privatisation), change from a government monopoly to regulated competition, and change to government producer price-controlled markets (quasi-markets).

3.1.1. From Public to Private Ownership

Competition can be introduced to the market by reducing the government's ownership and market share, whereby the production and services of the public sector diminish. This also pares the tasks, spending, and personnel of the public sector. Correspondingly, the share of the private sector increases, allowing organic growth for existing companies as well as the entry of new businesses. The previously regulated industry provides greater opportunities for the private sector. Privatisation also removes government inefficiencies from the market. The most obvious reasons for the inefficiency of a publicly owned company are the company's lack of objectives for maximising returns and increasing financial and production efficiency, along with the fact that the company cannot go bankrupt. Inefficiencies can be partly attributed to administrative weakness, which may result from the company not being managed through financial incentives but through political or social perspectives.

The main problem, however, is how to carry out production control so that the result of privatisation is the best possible for both the company and the principals (government and consumers)[3]. As private companies are primarily seeking their own interest, the difficulty is how to implement privatisation so that the status of the consumers is not compromised and privatisation does not cause unintended costs to the government. Privatisation does not always lead to better performance. According to Cuervo and Villalonga (2000), the varying results of privatisation in company performance are partly due to organisational issues. From a company perspective, privatisation is an exogenous change that causes a number of endogenous changes in the company's strategy and organisation. As a result, privatisation leads to changes in corporate governance and management replacement. This, in turn, changes the goals, incentives, and guidance that, again, transform strategy and structure. Naturally, these are affected by the regulation of the industry and the level of competition.

A key goal of privatisation is to reduce the inefficiencies of government-owned companies. Public companies are economically inefficient because of the extra personnel. It is also possible that, after opening the market, the government may seek to influence employment by providing incentives for private companies to increase work force. (Boycko et al. 1996.) Incorrectly guided government subsidies can lead to ineffective privatisation. Privatisation is only useful if the privatised company faces a more competitive market than before. If there is no competition in the market, companies do not face the risk of bankruptcy, or the markets are regulated, privatisation, therefore, does not necessarily increase efficiency (Kay and Thompson 1986). If producers' income is received as separate from the service, the private company becomes a public sector's producer and the responsibility for the services is shared between the producer and the government. This can be viewed through the lens of the principal-agent dilemma, or that of shared responsibility, as the private company's operations are based on an agreement with the government. Government and private service providers form a horizontal accountability relationship where the government uses contracts to provide products and services and shifts power to private companies. (Edwards 2011.)

[3] See Tjerbo's (2010) empirical study about principal–agent dilemma in healthcare.

Government intervention in the market is justified if the market has some kind of a functional or efficacy disruption and government measures can eliminate these disorders. Government is also better at allocating economic resources even in those industries and areas, in which private production is unable to fully function. Public ownership can correct the effects of asymmetric information and imperfect contracts, as its goals are usually social. In this respect, private companies may not be significantly more effective, but competition will at least remove the ineffective ones (Kay and Thompson 1986). Public ownership may also lead to imperfect outcomes due to political ambitions. Social goals are not necessarily equally targeted, whereby the development of well-being is skewed. In this respect, a balance should be found between market failures and the failures of politics.

It depends on the market how efficient companies need to be in each market area. Some markets, or submarkets, may be so small that the only profitable market outcome is a natural monopoly. A public monopoly can be considered as acceptable in the case of a natural monopoly because the government can then offer the optimal amount of products and services at a socially acceptable price. However, the government can also outsource production to a private company that is willing to operate under its conditions. The market can be granted to a producer, e.g., through an auction in which producers place bids based on their costs. In the model of Armstrong and Sappington (2006), this outcome outperformed both monopoly regulation and duopoly competition. In terms of welfare loss, the result remains the same (the market still has a monopoly) but the company with the lowest costs is selected for the market in the auction. Bidding for public procurements means that competition in that particular market only takes place at a certain time, during the auction. This affects the continuity of competition.

3.1.2. From Monopoly to Regulated Competition

The main reasons for imperfect competition are economies of scale and high fixed costs. In many industries, unit costs will decrease as production capacity is increased. The lowest average costs are achieved at the level where marginal cost equals average costs. Large companies have a competitive advantage that leads to concentrated markets. In the extreme case, only one provider can operate in the market. A monopoly arising from the economies of scale is a natural monopoly. Economic efficiency advocates this kind of market structure. Some industries are more prone to monopolies and, by their nature, continue to

be regulated by the price and market entry. Most often these industries rely heavily on distribution networks, such as railways, water supply, and energy production industries, e.g., electric power and natural gas. There is a general underlying theory in which the opening of markets, through regulation, would help the public sector to correct market failures and reduce government's legal power over economic activity (Winston 1993). Regulation assures that all producers are qualified as the market itself cannot effectively eliminate incompetent producers.

The opening of markets builds on a simple economic theory whereby any competitive structure is better than a monopoly because it can produce more goods and services, and at lower prices. A monopoly maximises its profits by producing the amount at which its marginal cost equals its marginal revenue. As a result, the amount produced is smaller than in perfect competition where companies produce the amount at which the marginal cost curve equals the demand curve. The difference, besides quantity produced and market price, is that a monopoly creates an efficiency loss that reduces total surplus and generates a smaller consumers surplus. Natural monopolies, on the other hand, have declining average total costs, so their marginal costs are always less than their average costs. If the price is set at the level of marginal costs, this will be less than the natural monopoly's average costs. The natural monopoly cannot operate at this price without subsidies. At the average price level the society has no need to pay subsidies but the price is not optimal because, again, it creates efficiency losses. The government can reduce social inefficiencies by introducing market forces to these imperfect operations.

Monopolies based on political decisions are often dismantled as there might not be an economically valid reason for keeping the industry under a monopoly. However, it should be remembered that even if the monopoly were dismantled and the market were opened to competition, this does not necessarily mean that the government might not interfere with the functioning of the market. The government may oversee the market without being an active producer itself. In the worst case, the opening of a market to competition may lead to the transition of some sub-markets from one monopoly to another – a shift from a government monopoly to a private monopoly. There could also be several smaller monopolies in the market. The number of monopolies in an area, region, or country depends on how narrowly or broadly each market is defined.

In theory, even monopolies are not safe from competition. Regional monopolies may be set to compete with each other through yardstick competition. If an authority determines the prices based on the average costs of regional monopolies, an individual producer does not need to worry about how its cost reductions might affect the price level, or government subsidies: as the impact of a single company remains small, each company is able to reap the full benefits of its cost reductions. The challenge here, however, is that costs vary by market area. The comparison of companies should be done by modelling costs that are essential and specific to the exact operating environment. In theory, all companies produce homogeneously within an industry and, thereby, each company works efficiently if it produces the same as the average producer. (Shleifer 1985.)

3.1.3. To Quasi-Market Competition

Le Grand (1991) explains the quasi-market system as a shift from the governmental monopoly toward free market competition. The key difference between the quasi-market and perfect competition is a static market price, set by the government or a regional authority. While there might well be enough companies in the market for perfect competition, the result does not fully reflect the outcome of "textbook" competition as the market price is not derived from the equilibrium of supply and demand. Consumers do not have the same purchasing power as they would under perfect competition because the money being used is usually earmarked and comes from the public budget. Hence, companies cannot increase their profit through price changes, and compete with services and their appeal, instead.

Opening the market to a quasi-market eliminates the welfare-reducing disadvantage of the monopoly, and, with independent producers in the market, provides consumers more opportunities to choose from. The shift to a quasi-market does not necessarily make companies effective, or markets perfect, though. Some supply side problems arise from cost increases, the misuse of resources, and the creation of a suitable infrastructure (Le Grand 1991). Another difference from perfect competition is that quasi-markets may also control the demand side. A consumer may be using earmarked money, which guides the consumer to use certain preselected services. These services may not fully meet the consumer's own needs, or be what the consumer would like to demand. This is why the

opening of the market does not necessarily mean that the consumer can choose services from a wider range.

Even when the markets are similar, the goals of the companies have an effect on how comprehensively, quickly, and easily the customers get their service. Companies look for efficiency, which does not, of course, mean the same thing for all. A company's performance goals are influenced by its size and costs, as well as the production components (e.g., machines vs. labour) of each company. Le Grand (2011) points out that companies operating on a competitive market are guided by their self-serving goals. Since the companies have to accept the market price, they can calculate their profit-maximising production volume and match their capacity with it. As the market price is set by the regulator, the producer's "price fall" directly benefits the company as a profit increase. Similarly, it can be assumed that if companies fail to comply with their agreements with the governments, or are unable to provide services at a set price, they will be forced to exit the market. Basically, the company has two options: to act in accordance with the requirements, or to exit.

3.1.4. Market Entry and Exit

In order for there to be any competition, there should be at least two operating companies in the market. For perfect competition, the market additionally requires that companies cannot, on their own, control market prices and that market power is not concentrated in any of the companies. The market is incapable of providing an optimal outcome through competition if the market structure is insufficient. The market structure has a significant impact on the company’s functions and financial performance. Markets are often characterised by the concentration of producers along with their competitive structure. This gives a quick and reasonably accurate assessment of the nature of competition in the market. In theory, the market structure affects the price level and cost structure of operators, and, hence, also profitability.

In principle, every company in the market has access to the same information and technology. In this respect, all companies share the same qualifications for functioning in the market, and, in theory, each company also has the same costs. Companies make decisions on market entry and exit based on incentives such as expected profit, prospects

of market power, and changes in demand. When new companies enter the market, leading to an increase in the number of firms operating in the market, market shares change. This has an effect on profits, and if some companies find that they are losing money, they will exit. This, in turn, will change the market shares of those companies that still remain in the market. In theory, the number of companies adjusts to the point where every company makes a zero profit and their average total costs are at lowest possible level. This number of companies satisfies the customers' demand. In practice, costs and profits vary because some companies work faster than others, or have invented more efficient production methods.

New entrants risk losing money because they must pay costs, e.g., for equipment or government licenses, that cannot be regained at exit. The entrant expects to gain a profit that exceeds this sunk cost. If the entry costs are large, they can deter market entry by creating a barrier to entry. The entry decision, therefore, is based on the difference between the sunk entry cost and the post-entry profits. The decisions to enter and exit are asymmetrical in the sense that entry is affected by all costs, whereas the decision to exit is influenced by everything else but the sunk cost.

If the producer base is firmly settled on the market, new companies may face barriers to entry. A company dominating the market, the incumbent, may earn a healthy profit, while entry remains unprofitable for others. The incumbent may enjoy marketing advantages, or there may be favourable regulations that benefit the incumbent. The incumbent may also deter entry with aggressive actions, e.g., invest on attracting new customers, if the barrier becomes strategic. Such barriers make the entry too expensive for a new company as it cannot expect to gain any profit if it enters. In case the market opening takes place in a sector that initially hosted a government-regulated monopoly, it is possible that the market entrant will not, at least in the beginning, get the same profit as the monopoly (Armstrong and Sappington 2006). If the monopoly has a strong market position and is able to cream skim, the entry of the competitor is not unobstructed. Additionally, asymmetric information hinders competition. If consumers are not aware of alternative producers, the opening of markets may be slow and the level of competition low. (Armstrong and Sappington 2006.) Barriers to market entry signal that market competition is not perfect and that it does not produce an efficient market outcome. Free entry and exit are conditions for perfect competition and for an efficient market. If, on the other hand, the company

needs to have a high initial capital and access to market takes a long process, the market is far from perfect competition. As noted by Klepper (1996), any company that wishes to join a market at a later date must be more competitive than the companies that already were there when it was opened. Additionally, companies that follow the market leader are always one step behind, which is why the level of competition may be low despite the number of companies or their relative market shares.

Market structure also affects quality. This has been attributed to the fact that, in a concentrated market, companies make less effort because of the lack of competition. In competitive markets, producers are under pressure to do better. If companies wish to reduce competition, they can merge with their competitors, or buy them off. Gaynor et al. (2015) state that mergers and market concentration lead to higher prices assuming that market prices are formed through supply and demand. To counterbalance this, the prevention of mergers and segregation of companies helps to keep prices low and markets competitive. If all providers have the same marginal cost, their relative bargaining power will not change because they all have the equal capacity to improve quality.

However, quality must meet the consumers' needs. In classic consumer choice theory, the idea is that the consumer strives for the highest possible level of satisfaction and utility. If the market offers the opportunity to solve the satisfaction problem, the prominent factor for the producer is to be the provider that has the best solution for the consumer. The basic role of accessibility is to create the conditions for meeting the demands of the market.

For companies, uncertainty is demand-driven and leads to delays in entering the market. If there is an entry cost for the market, companies may also delay exit and even accept a negative profit to ensure that they do not have to pay the entry fee again. The sunk entry cost, therefore, gives waiting an option value: waiting for additional information removes the uncertainty and makes waiting profitable. (Dixit 1989.) In theory, the difference between newly-opened and already established markets is that the entry of new companies slows down, possibly even so much that there are more exits than entries and the market shares stabilise (Klepper 1996).

3.2. Competitive Healthcare Markets

Healthcare markets differ from traditional producers' markets in many ways. In contrast to markets in perfect competition, healthcare lacks perfect information, multiple buyers and sellers, and free entry and exit. Free entry requires that no producer is being favoured and that there is no situation where the incumbent cannot be threatened by anything. Perfect information requires that consumers know how much, and what, they want to consume. From the consumers' point of view, there should be no big difference between producers, either. The other side of the coin is imperfect information and asymmetric distribution of information. The healthcare sector is characterised by the use of highly processed information, which is why a consumer might encounter problems in obtaining reliable information and evaluating the quality of service. (Olsen 2009.)

Often, as in the case of the Finnish healthcare reform, the opening of the market takes place in a market environment that pre-existed but with limited production and competition. The market is not created from scratch but mainly shifts from the public sector to the existing private companies' production. The moment of opening the market will have a great impact on how this change will affect the industry. The market structure and industry characteristics need to be taken into account when analysing the opening of the market. The opening of markets is affected by the services produced, as well as when and where they are produced. In healthcare, the industry product can be identified to be anything from a routine check-up to complex diagnostic services. Production is local and comprises small submarkets, each of which has its own competitive structure. Hence, the geographical market is not nationwide.

Due to regulation and high initial costs, private healthcare companies are mainly large or medium-sized. However, production models may change. One-person's ambulatory health services could have a significant competitive advantage particularly in more peripheral areas. Large companies often have a better financial position for producing new services and, therefore, are able to increase their market area. The opening of the market promotes the creation of a new competitive environment. The most important moment is when consumers register to producers. This determines how consumers get divided in each market area. Healthcare providers have long-term incentives to invest in company operation in order to increase their attractiveness and to reduce their costs (Ho 2009). One

way to do this is to merge with other providers. The merger increases their bargaining power, as well as their ability to negotiate with the authority (Ho 2009). The approach of the moment of market opening is visible long before the actual time. In Finland, the largest producers (by turnover) have already bought off some smaller companies from the market, or merged with them. Companies are well prepared for the opening of markets well before the big moment.

It is not given that a company operating in a regulated market receives a standardised income. Joskow (1973) found that the authorities are relatively passive in regulating a competitive market even when a company's rate of return increases. Slow changes in regulation result in large variations in company profits due to cost and price changes. Exposing an industry to market forces does not, however, have a clear outcome. Governments may have different expectations for outcomes in equity and efficiency. One of the goals of the reform, and regulated markets in general, is to increase efficiency and, through that, to improve equity. Change for the better is not self-evident. The meta-study of Dan and Andrews (2015) concludes that equity and efficiency remain unchanged, or that they change in the same way, when a market is opened. This could be seen, for example, in private sector not investing enough in treating "difficult" illnesses if that is deemed too expensive, or if it becomes unprofitable for the company.

Empirical research (Boussofiane et al. 1997) has not found a conclusive effect of how privatisation influences productivity. Furthermore, there is no evidence that technology or economical fluctuations would have an impact on the effect of privatisation. Rather than improve productivity, it has been shown that privatisation improves economic and financial development. On average, privatisation improves financial performance both in competitive and less competitive sectors. However, the results are not unambiguous if the sector is less competitive. (Megginson and Netter 2001.)

3.2.1. Requirements for Effective Markets

In economics, an efficient market leads to a market equilibrium where demand equals supply. There is no excess demand or excess supply. In practice, this is rarely realised. The producer market does not fully meet the demand, and demand is difficult to predict. In healthcare, consumers' needs vary and are unpredictable, and consumers rarely know what

they want themselves. In addition, in some industries there is a need for some regulation, either for the protection of consumers or the environment, or because the industry uses common resources. In the healthcare industry, the market opening cannot lead to a fully unregulated outcome: there will be some regulatory monitoring for the sake of patients' safety.

Some industries like healthcare may have barriers to exit. This means that if the company wishes to exit but is not, due to contractual reasons, allowed to, it has to remain in the market. Exit may also require regulatory approval. The barriers to entry and exit and their intensity have an effect on how cost-effective the companies on the market are. If market entry barriers are greater than the barriers to exit, only the most cost-effective companies will be able enter the market, and companies that fail to meet the market's efficiency requirements are quickly eliminated. If the barriers to entry are low and the barriers to exit are high, it is possible that a lot of inefficient companies will be crammed in the market: access to market does not filter out any inefficient companies, and because it is difficult exit, even inefficient companies remain there. If any firm can enter the market and use the existing technology, the number of companies operating there will be determined by the size of the market, i.e., demand. If the market is small (demand is low), and the expected revenues are lower than the expected costs, companies should delay entry until demand increases. Demand can increase due to migration, which increases total demand, or due to a shift in consumer preferences.

Perfectly competitive healthcare industry would be a zero-sum game where companies divide the market and one's gain is another's loss. According to Porter and Teisberg (2004), healthcare companies may, in some cases, even consume value by generating unnecessary costs (typically administrative ones). If the company is paid by the government, and the patient's received service is not in line with the financial resources used by the government, this might reduce net value. In this respect, the market is unable to benefit from competition.

In a situation where wins are made at the expense of others, companies have an incentive to create competitive advantages that distinguish them from their competitors. If customers feel that there are big differences between producers, it is possible that no competition exists even though there might be a number of companies in the market. While competition

is an essential part of how the market functions, in practice competition is often not perfect. Companies tend to limit competition in many ways, as this often allows a single company to have a greater market share and profit. The healthcare sector hardly differs from this as customers are, in most cases, unable to compare services or producers. Customers do not have enough information to make a comprehensive evaluation, and healthcare service is highly customised based on customers' needs.

Healthcare services can be considered to be substitutes as producers provide services which are substitutable. However, they are not perfect substitutes because there are differences in service quality, location of production, and customer service experiences. Through competition, companies are required to meet the customers' needs in terms of quantity and quality produced. It is not easy for companies to determine the average patient in healthcare, though, since many variables affect the health of the patient, and, hence, the treatment. By increasing the number of patients, companies can increase their income, but profit will only increase if they can improve their cost-effectiveness. However, cost-effectiveness must be achieved in such a way that quality does not suffer, since the deterioration of quality, or poor internal access, might result in the loss of customers: if the company has won itself too many customers and the outcome is that customers end up waiting or queuing for access to care, customers may well switch to another provider.

3.2.2. Choice and Competition in Healthcare

The public sector plays an important role for the optimal market outcome. Yet, it often appears that the public sector is inefficient on many levels. Typical weaknesses associated with the public sector include poor accessibility, slow response, and high costs. Increasing competition and bringing consumer choice to the market may well improve the healthcare sector.

The inefficiencies of public healthcare are often due to the fact that patients have no alternatives to choose from. If the customer has no choice, the producer does not really have any incentives to increase customer satisfaction. The public healthcare provider's reactions to low consumer satisfaction are perceived as slower and more inefficient than those of the private sector because it does not have an incentive for profit maximization and maintaining good patient relationships. If there are no other options besides the public

sector, the lower socio-economic group is more affected because their resources for seeking care and looking for alternative providers are limited. (Le Grand 2009.) There is also a downside to increasing consumers' freedom of choice: efficiency may suffer because customers are not able to make choices that would be in their best interest (Hanoch and Rice 2011). This is particularly so if they do not know how to use the information available, do not know where to get the information, or do not understand it. Of course, it is unclear whether the customer's choice actually improves health. According to Winkleby et al (1992), low level of education has been found to be the statistically most important factor among various socio-economic factors for increasing the risk of morbidity. The results on the effects of income or occupation, on the other hand, are not consistent. It is possible that education has a positive impact on lifestyles and values, and these, in turn, promote health.

In healthcare, as in any other consumption, the purchasing behaviour of a single consumer and the subsequent decision making result from a variety of different factors. Purchasing power and ability are guided by the consumer's personal characteristics that are reflected in the final choices. Behind the scenes, purchasing behaviour is driven by the surrounding society and the operations of marketers. It is not solely about the market situation, either, but about the decisions of the government that have an effect on the consumer's choice and the producers' actions, as well. The consumer not only selects the producer but also the service to be produced, i.e., where he wants to receive the service (Le Grand and Bartlett 1993). In this respect, patients are rarely able to make the decision. The only possible way is that the patient *thinks* he is making the decision while, in reality, the decision is made by the doctor. This is supplier-induced demand, a disadvantage of compensation models that potentially attract non-optimal performance.

Ellis and McGuire (1993) point out that the compensation system used plays an important role in healthcare and may potentially create incentives for supplier-induced demand. Supplier-induced demand results from asymmetric information between the patient and practitioner. The patient does not know exactly their own healthcare needs, or the quality of care they receive. If the patient has a low level of knowledge regarding their health, they tend to lean on expert opinion which, in turn, may lead to excessive care.

Davis et al. (2000) describe the role of a practitioner as an agent who is in the role of a decision-maker in controlling patients and their demand. In supplier-induced demand, practitioners manoeuvre demand in a way that matches their preferences. Potentially, this could have a positive effect on the producer's income. They tested the "supply hypothesis" by modelling how local doctor density (patients / practitioner ratio), the initiator of the encounter (doctor, patient, or someone else), and diagnostic uncertainty (none, low, high) affected the likelihood of three different outcomes of the encounter (prescribing, test ordering, and follow-up) in a data covering 143 New Zealand doctors and their encounters with 9,476 patients. The binary controls used in multilevel logistic regression modelling included the size of the practice, doctor's age group and work load, as well as patient's age, ethnicity and gender, plus 16 diagnostics groups. It turned out that the only statistically significant research variable was diagnostic uncertainty, associated with higher rates of test ordering and follow-ups. The result was actually more in line with an alternative research tradition that emphasises the pervasiveness of clinical ambiguity in medical care, claiming that it is the exercise of clinical judgement under conditions of uncertainty that produces inter-practitioner variation in decision-making, not the self-interest of practitioners. Consequently, the study failed to find conclusive evidence for supplier-induced demand.

The versatility of the compensation system influences whether there may be supplier-induced demand. With capitation, healthcare providers cannot gain excessive income by increasing healthcare consumption as the payment is tied to the number of customers and does not depend on the number of customer visits.

The introduction of choice and competition in healthcare can, at its best, produce significant benefits. If the compensation system is not properly designed, it may endanger equality and the quality of service. Propper et al. (2004) looked into the quality of hospitals following the opening of the United Kingdom healthcare market to payer-driven price competition. Their study examined the relationship between deaths due to acute myocardial infarction (AMI) and the degree of competition, measured as (*i*) the number of competing hospitals within a catchment area of 30 minutes driving distance, (*ii*) the number of hospitals per number of potential patients in the catchment area, and (*iii*) the share of each trust's[4] catchment population that could reach over 20 trusts. Control

[4] NHS Trust = a previously public hospital that became a separate legal entity in 1990.

variables included gender, age, London location, hospital size, and geographically-based administrative region. The opening of the market revealed a negative relationship between competition and quality: in areas of high competition, and where hospitals were packed in a small area, hospital deaths were slightly more common. The deterioration in quality due to increased competition could be noticed for five years after the start of the reform.

Conflicting results have also been obtained for increasing competition. Bloom et al. (2015) found that the addition of one competitor within 30 km radius around the hospital (resulting in an overlap of catchment areas with 15 km radii) reduced AMI mortality rate by 9.7% and increased (the subjective) management quality by 0.4 standard deviations. Better management was found to increase quality, satisfaction and financial performance, as well as to shorten waiting times.

Even if a service were produced in the same way by different producers, they would not be substitutes if they are located in geographically different areas. It can be assumed that producers are geographically different if they are located in different areas and if travelling induces costs for the customer. Competition between hospitals is sometimes measured using a fixed circular area drawn around the hospital (see Bloom et al. 2015). The hospital then competes with those hospitals that fall within this catchment area, i.e., hospitals are thought to compete purely with distance. This approach does not take into account other aspects that affect demand (Propper et al 2004). There is also a problem in determining the catchment area. It is difficult to determine the actual area for a hospital because it can easily exceed or fall short of the potential catchment area due to unobservable factors in demand. In this regard, the hospital's potential catchment area and the actual area differ.

Taking into account the cost of travelling, consumers often make use of the local healthcare provider (Bloom et al. 2015; Enthoven and Tollen 2005). The locality of service and the small number of patients who change the provider can become barriers to market entry for new operators. This, in turn, can lead to a reduction of customer's choices. However, any level of customer's choice will affect the company’s income: poor service encourages the patient to change their provider, and the mere threat of patients switching to another producer can give companies incentives for competition (Anell 2011).

Lyon (1999) analysed the customer's appreciation of quality and the effect of the distance in decision making. If there is no difference in quality between producers, the customer always chooses the closest one. Also, before the consumer has visited any of the providers, there is no difference between them as the consumer does not know their quality. Without any additional benefits, or better quality of care, travelling is only going to add costs to the customer. If there is a difference in quality between producers, and the more distant one is the higher-quality producer, the customer will be ready to travel assuming the quality increase outweighs the disadvantages of traveling. The added value for the customer consists of the resulting increase in quality, minus the increased cost of traveling. If total market demand does not increase, the producer can only increase its own market share by increasing quality. If producers increase quality symmetrically, the effects cancel each other out. In this way, quality competition can be considered as a game theoretical prisoner's dilemma where producers might just as well use fewer resources on quality. In principle, producers share the market if their quality is the same. If there are quality differences, the high-quality producer gets all the potential customers who are willing to change their producer. Customers who live closer to the practitioner are less likely to change their producer, particularly if the quality gain obtained from the other producer is smaller than the cost of traveling. If the customer knows the quality of the producer, demand is inelastic.

4. Healthcare Reforms in Europe

Public sector's inability to meet demand requirements may lead to privatisation and market opening. The inability may be due to the public sector's inefficiency: problems can arise, for example, from inadequate production (e.g., unreasonable waiting times). Customers may also be using the services of the private sector because the public sector is perceived to have a poor quality of service. Of course, privatisation can also be a governmental goal in itself, to reduce its interventions in the market. The downside is that the government will then be more dependent on the private sector in the provision of services. The moral value given to the idea that everyone should have access to healthcare services can be considered as a barrier to privatisation, particularly in the Nordic countries (Maarse 2006). Public services are valued because they are equally accessible to all. Additionally, there is the problem of weakening political influence. When the private sector is responsible for the production of healthcare services, public decision making no longer has the same effect as it used to have. A general trend is that the number of healthcare centres and hospital beds is being scaled down. From the mid-1990s to the mid-2000s, the number of care facilities has decreased in Finland, Denmark, and Norway. Despite this, the number of general practitioners and nurses has increased. (Masseria et al. 2009)

In this section, I shall present in more detail those European healthcare systems that utilise the so-called Beveridge system as their funding mechanism and also have consumers' freedom of choice. The Beveridge system means that healthcare is financed by tax payments, and government is responsible for providing the service either through its own production or via the private sector (Tountas et al. 2005). In the case of private sector production, private companies receive funding from the government. Another payment system used in Europe is the Bismarck system, in which each resident is required to have a health insurance (Maarse 2006). In France and Germany, both of which use the Bismarck system, customers pay the full cost of healthcare themselves and then receive a 70 to 80 percent payment credit from the insurance company managing the compulsory insurance. The providers of primary services are mainly private companies. (Mossialos et al. 2016.) The insurance competition has been seen to soften the price competition between healthcare producers (Lyon 1999). Since competition among healthcare companies is not as fierce under the insurance system, prices for healthcare tend to be high (OECD 2017).

In the Beveridge system, the government / regional administration is the producer and also sets the market price. The system thus creates a quasi-market based on the given price level and consumer choice. Some European countries utilise the Beveridge system, but the use of private healthcare is restricted (e.g., Iceland, Ireland, Portugal), or private healthcare can only be used through a health insurance (Greece) (Masseria et al. 2009, Siciliani et al. 2017, Sigurgeirsdóttir et al. 2014; Tountas et al. 2005). In the latter case, the healthcare system combines features of both the Beveridge and the Bismarck system. In this combination, however, consumers' freedom of choice is not independent of income or standard of living, unlike in the proposed Finnish model.

At present, the Nordic countries (excluding Iceland), England, and Italy are the only European countries that have adopted the pure Beveridge system in combination with consumers' freedom of choice. Table 1 provides a summary of their primary care structures and healthcare organisations. In Denmark, Norway, Italy, and Sweden, responsibility for the organisation and supervision of health services has been handed over to regions (England is an exception). In non-urgent cases, the patient's first appointment takes place through a general practitioner who acts as a gatekeeper for special medical care in Italy, England, Denmark, and Norway. (Mossialos et al. 2016.) The general practitioner also acts as a facilitator/referee for follow-up clinical activities and provides referrals.

A Norwegian study (Tjerbo 2010) suggests that competition in primary care increases the general practitioners' role as a gatekeeper by reducing unnecessary referrals to a specialist. The situation can be described through the principal-agent problem; the general practitioner operates as an agent and the funder (government) and the patient are both principals. The study also found that access to care (distance between patient and hospital) has a strong and negative effect on the number of specialists used.

Table 1. Healthcare organisation and primary care structure in the European countries that utilise the Beveridge system in combination with consumers' freedom of choice (Ferré et al. 2014; Masseria et al. 2009; Mossialos et al. 2016).

	Year of reform	Provider ownership	Entity	Payment system	Required registration	Gate-keeping	Private insurance
Denmark	2007	Private	Self-employed practices	70% fee-for-service, 30% capitation	Yes	Yes	39% complementary, 26% supplementary
England	1990s, 2008	Mainly private	Companies and self-employed practices	50-60% capitation, 15-25% fee-for-service, 10-25% pay-for-performance	Yes	Yes	11 % supplementary
Italy	1992, 2001	Private	Self-employed practices and group practices	70% capitation, 30% fee-for-service and pay-for-performance	Yes	Yes	15 % complementary
Norway	2001	Mainly private	Self-employed practices	35% capitation, 35% fee-for-service, 30% out-of-pocket	Voluntary	Yes	8 % supplementary
Sweden	2010	60% public, 40% private	Companies	80% capitation, 20% fee-for-service and pay-for-performance	Yes, except in Stockholm	No	10% supplementary

As pointed out in Table 1, healthcare reform and healthcare production through the private sector are fairly new to Sweden. Production there leans heavily on companies, while in other countries primary care is produced by self-employed doctors. Every country makes use of capitation, at least in some extent, as their payment system. Other payment methods are fee-for-service, where payment is based on services performed, pay-for-performance, where payment is based on performance levels and outcomes, and out-of-pocket payments, i.e., payments made by the customer (Mossialos et al. 2016). While healthcare is relatively inexpensive for the customers, many still rely on a voluntary health insurance. In most cases, and also in Finland, the occupational healthcare law obliges the employer to arrange the healthcare of their employees. Occupational healthcare and private insurances facilitate the presence and production of private operators even outside the public production.

4.1. Denmark

Since the implementation of the healthcare reform in Denmark in 2007, total healthcare costs have heavily increased. Expenses increased in both the public and the private sector. A major contributor to these cost increases is the aging of the population. However, the cost trend has stabilised in the 2010s, possibly due to the health reform. The trend in healthcare costs has stayed on the same level as in the other countries of the reference group. Unlike in the other countries, there has been only a little change in the ratio of private and public expenses, though. (OECD 2017.) In contrast with the other countries, most Danes have a private health insurance to cover a wider range of services (Mossialos et al. 2016).

Following the health reform, certain sparsely populated areas have encountered difficulties in obtaining general practitioners. As a result, some residents need to travel farther than before to get to the doctor's office. (Olejaz et al. 2012.) Based on the data of Statbank (2018) and consumers' options in Sundhed (2018), practitioners are concentrated in large cities (Copenhagen, Odense, Aarhus, Aalborg) with the largest number of producers. Relative to population, however, production there is at the average level for the country. While large cities tend to attract general practitioners, the outskirts of these urban centres actually have the smallest ratio of producers per population, and sparsely populated areas have as many producers per population as there are in highly populated cities. In absolute terms, however, sparsely populated areas and small islands have the smallest number of practitioners.

Producers of primary healthcare and special medical care are paid using a pre-agreed compensation procedure. The primary healthcare compensation system is based on capitation (approx. 1/3 of the doctors' income) and performance. The weight of the capitation payment is not affected by the structure or demographic characteristics of the patients but always remains the same. (Olejaz et al. 2012.) Expenditures are monitored through the budgets of regions and municipalities. If the budget is exceeded, the area will be punished with automatic sanctions. (Mossialos et al. 2016.)

Freedom of choice has been implemented in Denmark in two ways: the "traditional" freedom of choice allows the customer to choose a producer, whereas a voucher allows the

customer to select the producer from all available options on the market. The region decides the value and the service level for the voucher but does not explicitly accept the producer. (KPMG 2014.) Healthcare is largely based on self-employed doctors: nearly all primary healthcare is provided by private producers, but hospital activity is entirely produced and financed by the public sector. Primary healthcare practitioners act as gatekeepers to specialised healthcare and part of other municipal services. (Mossialos et al. 2016.) Service providers are selected utilising two methods. In the selection process, regions pick the desired number of service providers from companies fulfilling all selection criteria. The other method, tendering procedure, has the region calling for bids and then selecting at least two producers for itself. In this method, the main criterion is price. If other producers show up on the market and agree to the same price level, they also become part of the region-approved selection of producers. In case a region is unable to lure at least two producers to its area, i.e., no choice exists, the region provides earlier mentioned vouchers to its residents. (KPMG 2014.)

4.2. England

In the United Kingdom, healthcare is centralised and focuses on public production in Wales, Scotland, and Northern Ireland. In England, however, market forces and cooperation with the private sector have been hoped to increase the quality of healthcare, and its residents have the freedom to choose their healthcare provider even from the private side. While the United Kingdom has organised its healthcare in different ways in its constituent countries, UK residents have the right to use health services also in other constituent countries and regions. (Cylus et al. 2015.)

Since 2008, residents of England have been able to choose their healthcare provider freely. Competition has been seen to improve the nationally measured quality of producers, particularly in high-competition areas. In sparsely populated areas, competition is practically non-existent, though. The markets tend to be geographically small since some residents simply choose the closest health centre. (Siciliani et al. 2017.) Primary care is mainly produced by private companies, but there also are over 840 one-man centres in the country, which accounts for approx. 10 % of all health centres. Each producer is required to register for the Care Quality Commission register, which sets the quality requirements and monitors the producers. In contrast with other countries, production in England is not

supervised by the region. (Mossialos et al. 2016.) The quality commission monitors the activities of producers and publishes the results (performance) to encourage consumers' choice (Cylus et al. 2015). On average, nearly 10 % of NHS payments to general practitioners are based on quality payments (Digital NHS 2018). Generally, the compensation scheme is a mixture of customers' fee-for-service and the government's capitation and performance-based payments. On average, 60 % of the payment comes from capitation, and 10 to 15 % comes from performance-based payments and fee-for-service. (Mossialos et al. 2016.)

Based on data from Digital NHS (2018) and Office for National Statistics (ONS 2018), NHS payments per registered customer are highest in the area of East Anglia, and in the counties[5] of North Yorkshire, Herefordshire, and Worcestershire. There is no obvious common explanation for the high level of costs. However, these regions do have a low population density. Additionally, East Anglia has a low general practitioner per population ratio. Most general practitioners are located in high-population cities like Greater London, Birmingham, and Manchester. Based on the data of the Welsh Government (2018), the number of general practitioners has remained fairly stable in the United Kingdom – apart from England. In England, the number of general practitioners grew in 2004–2009 and in 2011–2014. After 2014, their number has been decreasing. Approximately 66 % of general practitioners are private contractors (Mossialos et al. 2016). Self-employed production is characteristic for the English healthcare system, as are their geographically small practicing areas. As a result, competition in these small areas is low. (Siciliani et al. 2017.) Consumers' freedom of choice is partly limited by the general practitioners' ability to receive patients. In order to secure access to treatment, nearly 11 % of the population has a voluntary health insurance. Most of them are occupational insurances. (Mossialos et al. 2016.)

4.3. Italy

In the Italian health reform of 1992, consumers' freedom of choice was increased regionally. In 2001, regions gained more power and full responsibility for organising the service. Regions set minimum requirements for quality and determine price levels.

[5] County = *kreivikunta* (in Finnish) / *grevskap* (in Swedish). England is currently divided into 48 ceremonial counties.

Compensation ceilings were introduced as a tool to control costs. In Lazio, Campania, Molise, and Lombardy circa 30 % of hospitals are in private sector, and doctors are either employed by a company or the state. General practitioners, on the other hand, work as entrepreneurs and are paid through a combination of capitation and fee-for-service. There are regional differences in the organisation of the service, which can be seen in the difference in efficiency between the South and the rest of the country. Changes in the healthcare system have been more useful in the institutionally better equipped northern and central regions. The problems of the southern part are thought to be due to the lack of healthcare resources, poor efficiency, and regional differences in the wealth of the population. While the freedom of choice and access to healthcare are national, interregional differences cause inequalities in financial provision and access to care. (Ferré et al. 2014.)

Private health insurance plays a minor role in Italian healthcare; approximately 15 % of the population has voluntary health insurance. Insurance can be divided into occupational insurances and personal insurances. Primary care is provided by self-employed doctors who usually work in group practises. (Mossialos et al. 2016.) The average size of the Italian hospital is about half of a UK hospital. There are a lot of small hospitals, and home care is very popular in the countryside, which is why national healthcare costs per patient are among the highest in OECD countries. (Ferré et al. 2014.) Also, the share of private costs is the highest among reference countries. According to OECD health statistics (2017), the share of private expenditure in total healthcare decreased from 27.4 % in 2000 to 21.5 % in 2010. From 2010 onwards, it increased back to 25 % in 2016. Measured in 2010 prices, total expenditure increased from 152.8 billion in 2000 to 181.7 billion in 2016. After 2010, private expenses have gone up by circa 5 billion dollars while public expenses have decreased by 9.7 billion.

Based on the data of I.Stat (2018), general practitioners have, on average, more patients in densely populated regions than in sparsely populated areas. A nationwide trend is that the number of patients per general practitioner has increased in 2004–2013. Another way to put this is that the number of general practitioners per 10 000 inhabitants has decreased – particularly in densely populated areas where the number of producers has decreased more than in sparsely populated areas.

An Italian study (Berta et al. 2016) did not find a statistical relationship between the degree of competition (market concentration on Hirschman-Herfindahl index) and hospital's ability to promote health. When a person's characteristics are controlled, the most significant factor for selecting a hospital is how many people in the same area have chosen that specific producer. In other words, asymmetric information in the market causes consumers to rely more on peer groups, i.e., other consumers. Consumers rely heavily on "word-of-mouth", practitioners reputation, and on information provided by media.

4.4. Norway

Since 2001, the Norwegians have had the freedom to choose their healthcare provider from all public and private healthcare producers in the country. Municipalities are responsible for organising at least two alternative healthcare centres within a reasonable geographic distance. (Mossialos et al. 2016.) General practitioners provide the necessary capacity for urgent cases. Hence, small municipalities with a low population density have more general practitioners relative to specialists. (Tjerbo 2010.) Based on the data of SSB (2018) and consumers' options in Minhelse (2018), producers are concentrated in Oslo. As in Denmark, the cities and municipalities surrounding the capital have the smallest number of practitioners relative to population. Large cities attract practitioners, and their surrounding areas seems to be secondary choices for producers. In absolute terms, the North and the mountainous regions of the West have the smallest number of producers, but relative to population they actually have the highest producer density. In sparsely populated areas, there are few options for consumers, which can be a problem for competition.

The willingness of customers to change the producer is restricted by the limitation that it can only be done twice each year (Mossialos et al. 2016). Despite registering, consumers are free to use the services of other medical practitioners, as well, which has further increased consumer choice. Following the opening of the market, some doctors have faced difficulties in obtaining registered customers and been selected by very few. (Grytten and Sørensen 2009.) Such primary healthcare services have been arranged almost entirely by private self-employed practitioners (Tjerbo 2010). However, the healthcare reform has not significantly increased the number of people in health and social services (OECD 2017). In addition, circa eight percent of Norwegians have a voluntary health insurance to ensure

quicker access to treatment, and occupational health insurance is still heavily used, as well (Mossialos et al. 2016).

Since the beginning of the 2000s, healthcare expenses have increased from 17.7 billion in 2000 to almost 30.7 billion in 2016. These cost increases have had a greater impact on the public sector. While private costs also increased, their share of the total actually decreased by almost 3 percentage points. (OECD 2017.) Approximately 70 % of the financing of private operations comes from capitation and other governmental funding, and the remaining 30 % comes from customer payments. Only a small part of general practitioners works in the public sector. This mainly happens in sparsely populated areas, where a substantial amount of regional bonuses is paid. As for hospitals, almost everything has remained in public production. As a result of the reform, expenditures increased substantially. The increase in expenditures is in direct relation to the increase in patient contacts, and can be interpreted as a result of improved availability of services. (Mossialos et al. 2016.)

Availability has improved due to customers' freedom to choose their general practitioner. Practitioners work as gatekeepers for specialist medical care services, which can be seen to curb costs (Mossialos et al. 2016). However, the high number of general practitioners leads to spare capacity that creates more costs (Tjerbo 2010). In itself, the high capacity of general practitioners might not have an impact on the use of specialists (Tjerbo 2010), but competition between general practitioners could potentially increase the number of referrals to specialists (Godager et al. 2015).

4.5. Sweden

In Sweden, freedom of choice in health services began to be increased in the 1990s, but the actual healthcare reform took place in 2010. The Swedish healthcare system is based on three objectives: the principle of human dignity, which ensures equal treatment for the whole population; the principle of needs and solidarity, whereby priority will be given to people in need; and the principle of cost-effectiveness, which means that the producer should take into account the ratio of treatment and incurred costs (Anell et al. 2012). The objective of better accessibility has been achieved, but the effects on quality, equality, and efficiency remain unclear (Ahonen et al. 2015: Mossialos et al. 2016).

Swedish healthcare expenditure relative to GDP is the highest in the OECD (Socialstyrelsen 2017; OECD 2017). Most of the costs in healthcare incur from basic healthcare and rehabilitative healthcare services (Socialstyrelsen 2017). Despite the high costs, there is no significant change in the number of doctor visits, which could be due to the healthcare reform (OECD 2017). The high costs can be explained by a large number of personnel: compared to other OECD countries, Sweden has the highest number of healthcare personnel (Konkurrensverket 2014). The healthcare reform actually increased the number of healthcare centres. In 2010–2013, the number of healthcare centres grew by almost 17 %. The trend of private ownership was already there before the reform: already in 2002, 27 % of the health centres were privately owned. (Ahonen et al. 2015.) In 2015, five years after the reform, 40 % of the providers of primary care were in private ownership and the remaining 60 % in public ownership (Mossialos et al. 2016). Between 2008 and 2010, the reform affected company sizes by reducing the shares of small and large companies. The share of small companies fell from 65 % to 63 %, and the share of large companies fell from 34 % to 32 %. By contrast, the share of medium-sized companies increased from 0.5 % to 5 %. However, the number of companies increased in all size groups. (KPMG 2014.)

After 2010, the number of new entrants has decreased. Primary healthcare providers have increased in number in all regions, even though results vary due to differences in statistical data that are caused by the lack of a definition for primary care. (Konkurrensverket 2014.) After the reform, new entrants have reported problems in obtaining enough customers, while the established producers in the market have reported significant increases in income. With a smaller client base, the financial risk increases. (Anell 2011.) There are, however, regional differences in getting customers. Healthcare centres located close to each other do not compete in patients because they generate a positive marginal effect: nearby operators often also gain new customers when a healthcare centre in their proximity obtains customers. (Konkurrensverket 2014.)

Glenngård (2013) analysed variation in patient satisfaction with respect to organisational factors. Swedish healthcare reform increased the number of primary care practitioners by circa 20 %. Private companies that have entered the market after the reform have mainly been smaller than those that were established before the reform. Based on customer satisfaction, private providers are considered to be better, but the difference in quality of

service between the private and the public sector is not perceived as large. On average, residents of large cities have lower satisfaction with the services provided. This may be due to the fact that people living in a city have higher standards for service because they can switch between service providers more easily.

Despite freedom of choice and market opening, the public sector's share in Sweden remains strong. There is a lot of regional variability in compensation payments: approximately 40–80 % comes from capitation payments, 20 % from consumer payments, and the remaining part consists of variable payments (Anell et al. 2012). The criteria for compensation vary by region. In order to create incentives and to improve control in the compensation system, several regions have changed their compensation criteria over time. Compensation is partly determined on the basis of performance level and qualitative aspects (difficulty of diagnosis). Regional bonuses are also applied in some regions, particularly in sparsely populated areas. (Lindgren 2014.) If the producer is included in national quality registers and reports on the quality of its service, the producer may receive additional compensation (Kvalitetsregister 2018).

All regions in Sweden use capitation payments as their primary compensation method. Compensation is regulated locally, and each region decides on it independently. This means that there are big differences between models used. Basically, there are four compensation methods that are being utilised in Sweden (Lindgren 2014):

1. Appropriation: the payment is based on a predefined budget
2. Capitation: the payment is based on the number of registered customers
3. Product group compensation: e.g., based on diagnosis made
4. Work-based compensation: the producer will be compensated afterwards

All compensation methods have their advantages and disadvantages. The purpose of these different models is to minimise the potential risks of the other models. The compensation schemes can be divided into two categories: fixed and variable. Fixed compensation is the most important method for managing public funds, while variable compensation models ensure high productivity – but at the expense of higher costs. (Lindgren 2014.)

In addition to the previous breakdown, Lindgren (2014) characterises compensation with two further indicators: time and activity. Compensation can be determined either in

advance or afterwards. In the case of advance payment, the producer receives a fixed amount of money that does not take into account the actual costs that emerge. If the reimbursement is determined afterwards, the producer is paid for the actual use of resources. This creates different incentives for producers: in the case of advance compensation, the producer tries to produce the services as efficiently as possible, and if the reimbursement is made afterwards, the producer strives to do as much as possible. In the activity dimension, compensation can either be fixed or it can be based on the number of customer visits. In the case of variable compensation, the producer has financial incentives to receive as many customers as possible. In the case of fixed compensation, there are no incentives to enhance production.

Despite the versatile reimbursement system, over 70 healthcare centres have been closed after the reform was put into action. Some private centres went bankrupt, and some merged with another centre. None of the centres that defaulted were in sparsely populated areas, but in high competition areas with a lot of producers. (Ahonen et al. 2015.) If a private company goes bankrupt, the region is not liable to make any compensation to the company. The responsibility for organising and providing the service lies on regions. They have the responsibility to maintain the required service level even in areas where there is low demand, or where the production of services is not profitable for private companies. (Sitra 2012.) However, the public sector must still produce healthcare services even when producing them is unprofitable.

There are no accurate results about whether Sweden's targets for the healthcare reform have been achieved. Objectives related to accessibility have been achieved, more or less, but it is uncertain how this has benefited different population groups. (Glenngård 2016.) It has been found that healthier people have required more medical examinations while relatively sicker patients have made fewer visits to the doctor after freedom of choice came into force in healthcare (Socialstyrelsen 2015). Glenngård (2016) also maintains that, even though comparative information has been published of service providers, consumers rarely use this information when they make the choice. Consumers are encouraged to use the producer they have been registered to as in the customer pricing system the price of the selected producer is lower than the price of any other healthcare provider (Anell 2011).

5. Risks in the Finnish Healthcare Reform

The greatest risks in the healthcare reform of the aging and sparsely populated Finland arise from the potential lack of competition, cream skimming by producers, problems in the management of the service network, and cost outsourcing. Also, the date of opening up the market to private companies has an influence on all these risks.

Apart from the moment of market opening, there will be a periodic exchange of customers in the market. Since customers can switch to another healthcare provider after six months, it is, in theory, possible that the market will be redistributed twice a year. As the customer is unaware of the quality offered by other producers, his or her welfare may either increase, decrease, or remain unchanged in the change. If the customer's welfare falls, it will remain on this lower level until the customer is again allowed to make another switch. The customer can then change back to the original producer in order to regain his or her initial level of welfare, or opt for a third producer and make another gamble with his welfare. The structure of the market does not equate perfect competition even though consumers may freely choose a producer from the market. This is because the market price is not determined by the equilibrium of supply and demand, but the price is set by the region, which means that the markets are quasi-markets.

In practice, the budget for healthcare services in each region is prepared by looking at external factors such as population size, population density, and other factors that determine the cost of services. It can be expected that regional and municipal budgets will be drawn up using the data from previous years, i.e., when healthcare was operated by the public sector. Following the opening of the market, capitation may either fall or rise. Given the pressure to cut costs in rural areas, it is possible that the required cost reduction will take the form of a reduction in capitation payment. It is also possible that the capitation payment may need to be raised for producers to be able and willing to practice medicine in the market. If the government is willing to foot the bill, a contrary problem may arise in the form of overproduction.

5.1. Lack of Competition

The whole ideology of opening markets to private competition rests on the idea that, since companies face competitive pressure, they need to improve their operations to maintain their position in the market. It can, therefore, be assumed that the market will provide the best outcome for services. The budgets of the companies determine the level of quality and quantity, and competition ensures that the same outcome cannot be produced at any lower cost. The level of competition has an impact on the market structure and, through it, also on the income, costs, and the quality of service of companies. Of course, if there are only a limited number of companies in the market, consumers' freedom of choice cannot be guaranteed. The limited customer capacity of markets forms a constraint for competition and consumers' choice. Other constraints that can cause paucity of competition in healthcare are the lack of information and information asymmetry. Consumers are dependent on the doctors' professional skills. Since customers often do not know the quality of service they have signed up for until actually paying a visit to the producer, replacing a producer may be extremely slow. A patient who is in good basic health may not use medical services on a regular basis, or at all. The registration of healthy customers is ideal for companies: they remain unaware of the quality of service they are set to receive, and thus have no need to change their provider, either. Customers' immobility between producers can, therefore, hobble competition.

Newhouse et al.'s (1982) empirical study shows that the distribution of doctors is consistent with standard location theory derived from demand factors. One assumption is that doctors do not have practices in sparsely populated areas because only large cities have sufficient demand for their services. In sparsely populated areas, on the other hand, financial risk by individual patients would be too high. While doctors might be able to influence the demand, they continue to act as economic agents in choosing their location, tending to favour larger cities due to their higher demand. It is not ruled out, though, that cities may also attract doctors by offering better quality of life outside work.

The preferred location of doctors can also be studied from the substitution point of view. If the market does not consider general practitioners as substitutes for specialists in the provision of basic services, general practitioners are more likely to practice medicine in small towns or in more sparsely populated areas. If consumers prefer specialists, or if

nurses refer[6] the patient directly to a specialist, the specialist will obtain a higher market share than the general practitioner. If markets regard specialists as more qualified than general practitioners, or, more generally, as better producers, the market area of the specialist will be far larger than that of the general practitioner. As a result, general practitioners will be more willing to work in sparsely populated areas than specialists are. Consequently, consumers' preferences and the "semi-automatic" distribution of practitioners tend to hinder competition. (Newhouse et al. 1982.)

As the number of service providers grows, availability of primary healthcare improves. As a result, unnecessary use of specialists could decline since fewer consumers are then expected to need a specialist (Masseria et al. 2009). Additionally, if patients have better access to primary healthcare, this should, to some extent, prevent the development of some serious health problems. Improved access could potentially improve the treatment of diseases that require monitoring (diet and lifestyle problems, weight, hypertension, blood glucose).

Organising competition in sparsely populated areas will be a problem. Before the reform, the Finnish government had local monopolies in the provision of healthcare. There may be major difficulties in getting more producers to areas that have low demand. The lack of competition will be a common problem in the management of the service network.

5.2. Management of Service Network

There is no automatic mechanism that would provide complete market coverage. Companies will primarily provide services in the best of locations, preferably where there are lots of customers. Geographical fragmentation and inefficiency is the flipside of having a comprehensive service network as responsibility for healthcare services resides in individual municipalities and regions. Finland is comprised of demographically very different regions, which means that the same service system cannot be used for the whole country. The geographical accessibility of health services and their need for change must be assessed by taking into consideration the population, age structure, and the possible use of digital production forms. In organising basic services, one needs to compare, at least on

[6] Referral = *lähete* (in Finnish) / *remiss* (in Swedish); nurses' or doctors' referral to seek specialised care or have further examinations.

some level, production efficiency and accessibility to services. In highly populated and mid-sized municipalities that already have comprehensive production networks, it could be possible to concentrate production into larger healthcare centres to eliminate the inefficient fragmentation of the market.

In sparsely populated areas, were basic healthcare cannot be effectively centralised, has a greater risk to end up in fragmented market outcome. Fragmentation can be prevented by regional level production management and by centralised service procurement. Centralised procurements in sparsely populated areas can yield cost and efficiency gains, but they also cause market concentration. In concentrated markets, the effect of competition deteriorates as the market shares of producers grow.

By choosing a producer that is able to produce services in multiple locations, a single provider's network can be more efficient than the network of several producers. The advantages of centralised procurement are often synergies. This benefit is generated by the economies of scale and consistent production, which means more centralised services and avoiding overproduction. Optimising the service network will bring cost-benefits to the efficiency of operations. However, if centralised procurements are made in sparsely populated areas, they will inevitably affect the customers' choices.

There are challenges in the management of the service network both in sparsely populated areas and in densely populated areas. In some regions, there will be a problem in aligning the supply and demand differences. In economics, the equal distribution of products and services can be managed through demand and supply controls. Demand and supply controls are required in order to achieve a cost-effective and wellbeing maximising result (Cutler and Zeckhauser 2000). Without any controls, the result will hardly be optimal. Neither of the controls alone helps the optimal allocation, so both are needed. Demand-side mechanisms tend to restrain unnecessarily high demand, and supply-side controls aim to control the intensity of customer visits. The article by Cutler and Zeckhauser (2000) mentions three reasons for demand and supply controls:

1. To control medical interaction; sharing the consumer costs affects how the customer uses healthcare services. If the customer is required to pay something, it can prevent unnecessary visits. Controlled care can also reduce the number of services provided.

2. It increases customer-specific flexibility of treatments by combining demand and supply-side controls, i.e., using customer-specific payment methods and financial incentives. By providing heterogeneous forms of treatments and payment schemes, an optimal solution can be achieved.
3. Limit providers' cream skimming, such as avoidance of expensive customers due to insufficient capitation. More effective cost sharing reduces the rejection of very ill patients.

One of the complementary goals of the healthcare reform is to increase the number of digital functions. On the one hand, this is done through online services that provide information about service providers to facilitate comparison for consumers. On the other hand, digitalisation means that, in peripheral regions, some of the services are being produced electronically. These do not, however, guarantee the functionality of the service network if the user does not know how, or is otherwise unable, to use the services provided by the region. Digitalisation and new forms of service (e.g., ambulatory service units) are expected to help when the service network is cut back, and to clarify and focus the service offering when there is a need to reduce spending on health services. Ambulatory services could potentially improve local access to services. This service model could create a comprehensive network and have a major role for some population. However, relative to "traditional" service provision, creating an ambulatory service would potentially generate cost pressures that the private sector might not want to participate in, let alone that the range of providers would be comprehensive enough to create competition.

5.3. Financial Compensation

Effective compensation improves efficiency of primary care if it encourages companies to increase consumers' access and minimise costs. The wage expenses of the public sector make production inefficient because physicians do not have incentives to change their performance. Also, public healthcare does not have incentives to improve access or shorten waiting times. For the same reason, the government should not pay the wage costs of the private sector, even for small producers.

Robinson (2001) analysed compensation in healthcare through its four functions: high productivity, risk acceptance, efficiency, and information sharing. The fee-for-service

model provides a high level of productivity, so practitioners are encouraged to do more to get more revenue. Fee-for-service compensation encourages practitioners to accept risk and also to treat patients that require demanding treatment. The downside, however, is that fee-for-service does not take into account cases where the practitioner needs to spend a long time with the patient, e.g., due to a severe illness. Instead, it encourages treating as many patients as possible, which may be in conflict with the quality goal pursued. Capitation payment is not effective in either of the previous cases because there is a risk of paying either too little or too much, depending on the service level. It also ignores the level of complexity of the work and the associated costs.

The positive side of the capitation payment is that it contributes to encouraging medical personnel to share their professional expertise, making it possible to achieve cost-effective results. It also prevents supplier-induced demand because the producer does not get more income even if the provider did recommend further examinations to customers. On the other hand, capitation can encourage cream skimming, which means that cheaper customers are favoured at the expense of more expensive customers. Based on these assumptions, it is clear that achieving high performance in all dimensions (high productivity, risk acceptance, efficiency, and information sharing) is not possible by using just one compensation method. A combination of compensations can be considered as the best option because neither compensation model alone is likely to produce optimal incentives and results. (Robinson 2001)

Fixed compensation is linked to production risk. It is possible that producers reduce services or underperform because everything that is done to the patient generates costs, and, thereby, reduces profits. A Norwegian study (Iversen and Lurås 2000) found that reliance on the capitation payment increases the number of referrals made to specialists. A private producer benefits financially from being able to transfer expensive customers elsewhere. The situation is problematic for the public sector because it can be clinically justified to send patients with a difficult diagnosis to a public hospital or a university hospital for further examination. The private sector then does not have to bear the financial burden of a "difficult patient".

A fixed capitation payment may have the effect that producers start to avoid difficult diagnoses. Pre-paid capitation may not cover all costs for the company and may reduce net

income in the treatment of patients with more serious illnesses, and of those patients who require more time. Newhouse (1996) studied the efficiency of healthcare production and customer selection, observing that the more the government supports healthcare plans, the lower the incentives for the insurance company to enhance its operations, leading to higher healthcare expenditure.

This model can also be applied to the case of Finland by replacing the insurance company with a healthcare provider whose production risk is based on the customer's health. The risk exists due to the producer not knowing in advance how much it will cost to take care of the customer. If the compensation model also covers the treatment of expensive patients, the producer need not worry about treatment costs. While this reduces the risk for the producer, it simultaneously increases the costs for the government. The government can change the producer's incentives to encourage efficiency by tying the producer's income (compensation) to its own goals. This way, the government again transfers its own cost risk to the producer. The purpose of government incentives is to make producers provide their services as cost-effectively as possible. Issues with the compensation system, incentives, and production planning are all risks that affect the emergence of competition and the consummation of customers' freedom of choice.

5.4. Cream Skimming

In the reform, the production of services will be transferred to private companies, and there is a risk that companies will choose their customers. Regions do not have proper tools to manage the production chain because, at least for time being, they are not in the role of a gatekeeper. Gatekeeping refers to the management of patients' treatment and influencing treatment decisions. Consequently, the regions do not have the ability to influence their residents' treatments and the volume of production (quantity and scope). For markets to be effective, they should be organised in a way that takes into account the heterogeneity of customers. Cream skimming is seen as a problem of market-based competition rather than as a problem that could be present in public healthcare (Ellis 1998). Discrimination or neglecting customers is illegal in market-led healthcare, as well, but it does not mean that companies cannot do so. Companies can engage in cream skimming by "bribing" low-cost customers, e.g., by providing vouchers for a partner company's services. Cream skimming is not just one process, but a four-part ensemble: "creaming" means favouring affordable

customers and offering services mainly for them, "skimping" is underperforming in services to costly customers, and “dumping” is the complete inhibition of expensive customers (Ellis 1998).

If compensation is based on registered customers, companies prefer customers that are easy and induce low costs. The producer maximises its profits with "easy" customers. In practice, cream skimming can be done by customer types and by operating areas. Companies may seek to locate in areas where the population is healthier, or they only offer services that do not incur high costs for them. As the regulator, the region should provide a compensation model that eliminates the possibility of cream skimming.

Geographic inequalities in health may also be a result of cream skimming. If doctors initially prefer healthier areas, the sicker areas may not improve at all. According to Matsaganis and Glennerster (1994), it is not the compensation model’s inability to predict costs, per se, but insurance companies’, or in this case, healthcare producers’, ability to recognise the costs of different customers that facilitates cream skimming. The effectiveness of capitation in reducing customer discrimination thus depends on the size of the error made in cost prediction. The flipside of customer discrimination is the use of scarce resources for only the very ill patients. The compensation model should leave adequate financing in companies after all necessary investments, so they can also focus on improving the health conditions of their customers as a preventive measure.

Some investments are only possible with a large population, so companies must be able to co-ordinate their operations and be able to share customer benefits. If companies are not able to operate effectively in the market, it is possible that some of them will exit the market because of excessive costs or risk. A single producer benefits if the customer risk is spread over large numbers of people. In a large population base, a company can have a diversified portfolio of low-risk and high-risk customers. Where high-risk customers are expected to use more health services, it is possible that low-risk customers will not use them at all. Even when the customer does not use the services, the company still receives the capitation payment. If there is a big difference between the expected profit and the actual profit for the company, it is possible poor performance will lead to the company exiting the market. Abandoning expensive markets is also a form of cream skimming. For this reason, regions have to make binding, long-term contracts with the producer.

5.5. Cost Outsourcing

Due to the opening of the market, work and responsibilities that previously belonged to the public sector will partly move into the hands of the private sector. Outsourcing does not necessarily reduce government intervention but it does tie the private sector to the production of public services. The private sector becomes an agent for the public sector, and its purpose is to meet the government's targets. The healthcare reform stems largely from the idea that competition reduces costs because highly expensive entities cannot cope in competition. The role of the public sector is to organise the service, hence outsourcing requires transparency and trust in operations.

The advantage of public production is the ability to control labour costs (Le Grand and Bartlett 1993). If a service previously produced by the private sector is transferred into public production, the service cannot be produced at the same price if wages originally were different in the public and private sectors. With the decrease in public healthcare production, some public healthcare employees will move to the private sector. A part of the private sector, on the other hand, turns into producers of public services.

In the opened up healthcare market, producers function like insurance companies. Producers are responsible for their own costs and those caused by customers. This would give them an incentive to prevent illnesses and control the health of their patients. Hence, they would have an incentive to seek cost-effective production methods for the services their customers need. Private companies are automatically profit-seeking units but their production goals do not necessarily align with those of the public sector. Even though companies produce services as independent and private enterprises, they still have contractual responsibility for the public sector. As it is the government that determines the industry price level, the market structure cannot be directly compared with perfect competition where the equilibrium price is found through demand and supply.

6. Empirical Research

In this section, I shall present *a priori* calculations on how capitation and the size of the producer will affect market outcomes and customer choice in the Finnish healthcare market. At this stage, market outcomes and customer choices can be modelled for municipalities by changing two variables, compensation payment and producer size. The compensation model, and, in particular, to what extent the cost of the customer is reimbursed to the producer will affect the number of producers in each market. For example, in a sparsely populated area where the production network is not going to be particularly rich due to the small number of residents, how the region covers the costs of the producer is of great importance for the outcome. If the reimbursement is low, the market simply cannot have many operators as production quickly becomes unprofitable. Similarly, producer size will affect how well the goal of consumers' choice is achieved. If the market is allowed to have small producers, i.e., small health centres with only a few doctors and nurses, the market may well be able to support several health centres, thereby fulfilling the objectives of consumers' choice and competition pursued by the government. Also, if the markets are allowed to have self-employed "one man's" practices, freedom of choice and competition will become even more intense. This mathematical exercise does not include an evaluation of cost trends or migration flows of residents, just a comparison of how the Finnish municipalities would fare in the healthcare market at the moment.

6.1. Data Description

The variables utilised in the exercise were the municipality-specific populations (31 December 2016), the surface areas of the 297 municipalities of mainland Finland (municipal division of 2016), and municipality-specific primary healthcare costs. The data contains two exceptions to the current (2018) municipal division: the former municipalities of Luvia (merged to Eurajoki in 2017) and Juankoski (merged to Kuopio in 2017). Municipal primary healthcare costs and the numbers of residents were obtained from Statistics Finland (Tilastokeskus 2017), and the data on the land areas of municipalities from National Land Survey of Finland (MML 2016). The municipal population density (i.e., $\frac{\text{population}}{\text{land area}}$) figures were calculated from the latter two.

Since the actual market opening has not yet taken place, nor affected the Finnish healthcare market, there is little data available about the outsourcing of healthcare services. Data of public procurements (TEM 2018) offered material on public purchases from the private sector, indicating which municipalities or regions used more private sector products and services in their public functions. The problem with this data was that it did not indicate the time periods paid for, or the validity of service contracts. Furthermore, it did not cover privatised municipal health centres. Due to these shortcomings, this data was not utilised in the calculations.

Instead, the numbers of private producers in each municipality following the opening of the market were evaluated by varying the size of the capitation payment and the producer size. The potential magnitude of future capitation was assessed on the basis of an ongoing freedom of choice experiment, in which consumers' freedom of choice is being tested in a few municipalities (Hämeenlinna 2017; Jyväskylä 2017; Keski-Uusimaa 2017; Tampere 2017; Vuorensola 2018). In this experiment, capitation ranges between 120 and 160 euros for those between 0 and 64 years old. As for 65-year-olds and over, the capitation payment is, at its lowest, 240 euros and rises all the way up to 560 euros. Changes in the consumer's ability of making a choice were examined by changing the size of the capitation payment within the range observed in this experiment (120, 200, 300, and 400 euros per year per person). Another variable used in the generation of scenarios was producer size, measured in turnover required for the producer to break even. The producer sizes used in scenarios were determined on the basis of a comparison of two profitable private healthcare providers (Mehiläinen 2016; TT vuosikertomus 2017) – their turnovers, numbers of healthcare centres, and numbers of personnel. The producer size classification of small (500 000), medium (1 million), and large (2 million) is suggestive, as special medical services and administrative personnel cannot be separated from the turnover rates.

The level of competition, defined as the number of companies that a market of interest can accommodate assuming all healthcare companies in the market are of identical size, was calculated by dividing the population of the market area of interest by the (minimum) number of customers required for the company to be profitable (= turnover requirement / capitation). In other words, $\#\,\text{of companies} = \frac{\text{population}}{\frac{\text{turnover}}{\text{capitation}}}$. The examination of markets was done both on the municipal (297 data points) and regional (18

data points) levels under the simplifying assumptions that customers cannot cross municipal / regional borders in search of medical care, and companies cannot attract customers from other municipalities / regions (this possibility will be addressed in discussion).

6.2. Results

Approximately 38.7% of the Finnish population is located in the nine cities with over 100 000 inhabitants (Tilastokeskus 2017). The relationship between municipal population density (x) and primary care costs per inhabitant (y) is best described with the logarithmic function $y = a + b \ln(x)$, where $a = 1050 \pm 20$ ($t = 47.6$), $b = -109 \pm 8$ ($t = -14.5$), $R^2 = 0{,}4145$ ($r = -0{,}6438$) (see Figure 2). Cost variation is greatest in small municipalities with fewer than 10 000 inhabitants. The result can be interpreted in the way that the more sparsely populated the area is, the higher the *per capita* cost of primary care is. The rate of change is greatest in municipalities with a population density of under 20 inhabitants / km^2. Costs hardly decline after municipal population rises over 30 000 inhabitants, and, at the high end of population densities, remain at around 500 euros per resident even when the population density increases from 500 to 3 000 inhabitants / km^2. High population density reduces the distance between the producer and the patient, possibly increasing the usage of care.

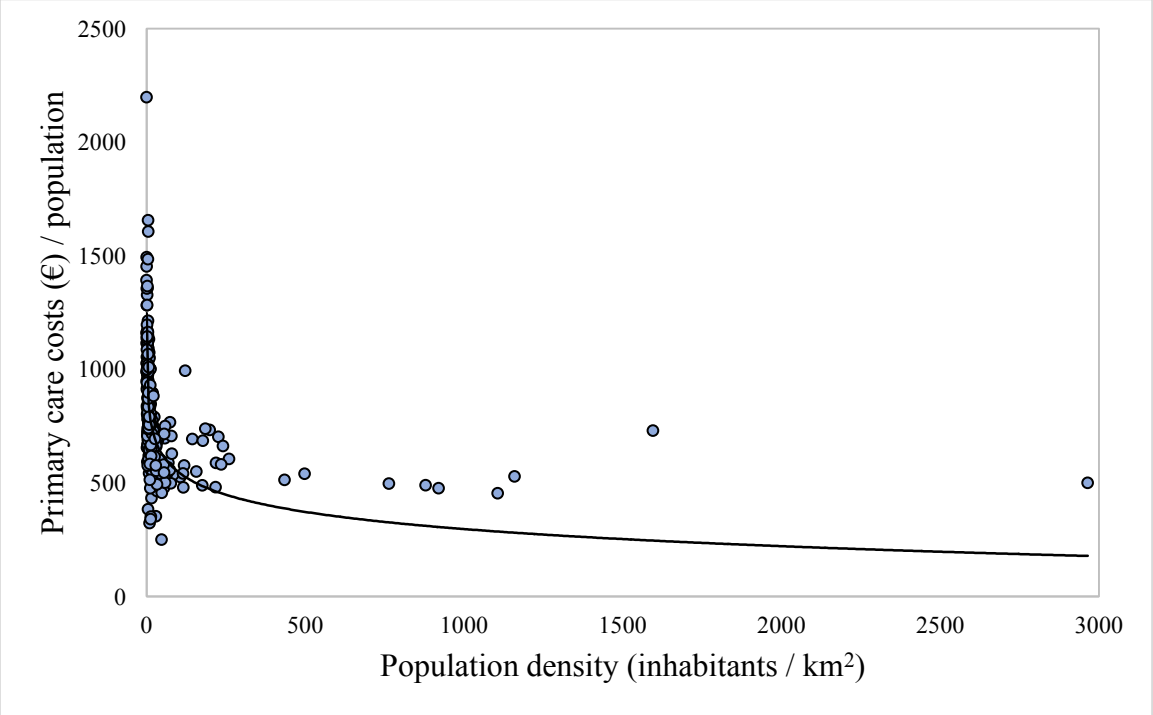

Figure 2. Municipal primary care costs (per capita) by population density

If annual capitation is set at 400 euros per customer, a healthcare centre needs 5 000 registered patients to reach a turnover of 2 million euros. At this capacity level, the most susceptible areas for a monopoly (indicated in yellow in Figure 3b) are Central Ostrobothnia, Central Finland, Kainuu, North Karelia and Lapland. The same market outcome can be also be achieved with smaller capitation and smaller producer size: if capitation is decreased to 200 euros per customer, the same result will be obtained by lowering the producer's turnover target to 1 million euros. Of the whole population, about 6.1 % would then live in a municipality that does not have a private healthcare centre of its own, and about 10.8 % would be customers of a monopoly.

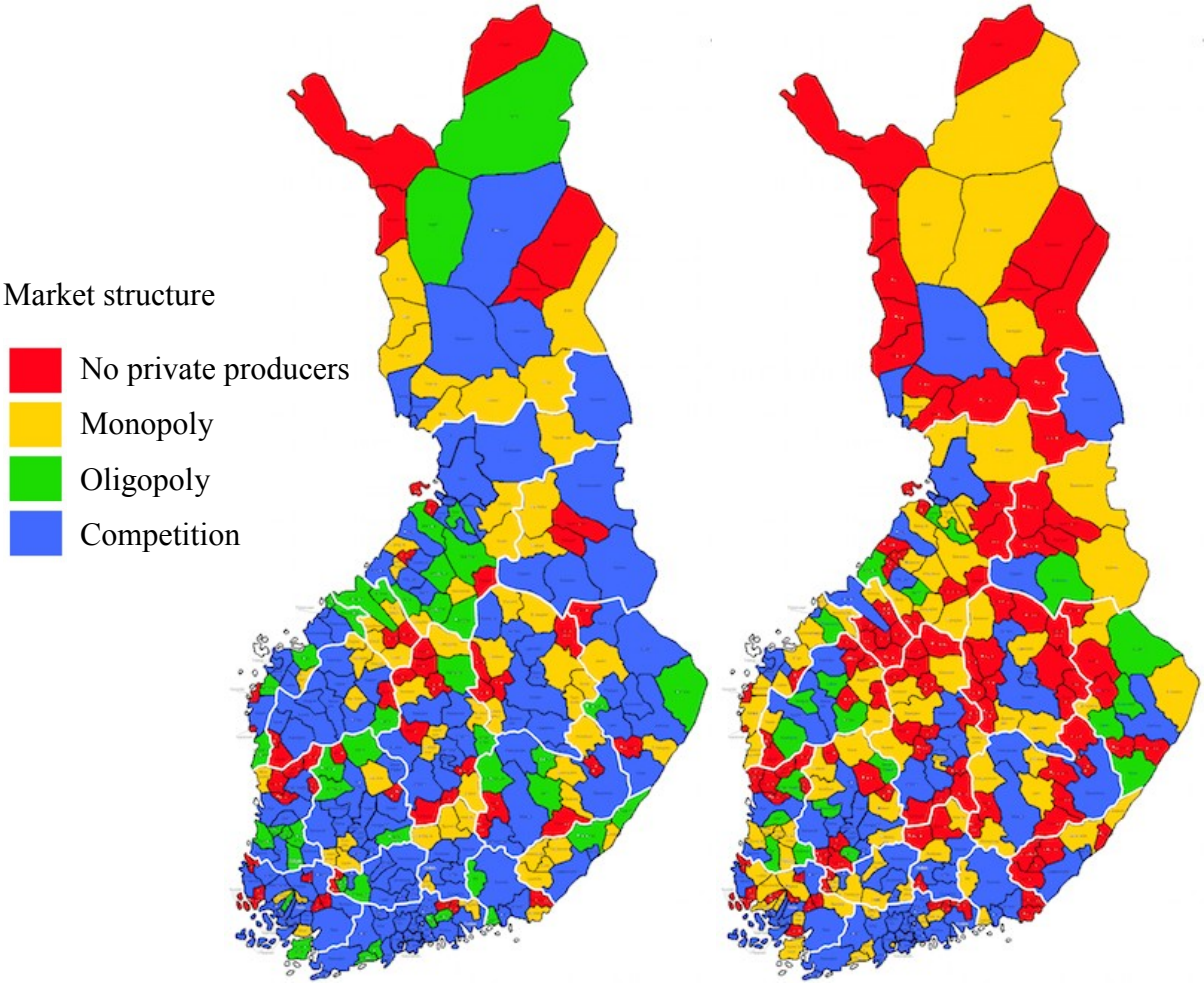

Figure 3. Potential market structures related to specific capacity and capitation outcomes. (a) On the left, 2 500 capacity (from a turnover of 500 000 euros per year with a capitation of 200 euros per customer, or 1 million turnover with a capitation of 400 euros). (b) On right, 5 000 capacity (from a turnover of 2 million euros per year with a capitation of 400 euros per customer, or 1 million turnover with a capitation of 200 euros). Monopoly (yellow) is a single producer's market, oligopoly (green) is a market with two producers, and competition (blue) is a market with three or more companies.

Under the 5000 patient capacity requirement, 22 municipalities would land ten or more producers each, and five of them would have at least 40 producers (Helsinki 127, Espoo 55, Tampere 46, Vantaa 44, Oulu 40). In the region of Uusimaa, there would be approximately 328 healthcare centres, whereas in Kainuu there would only be 15 centres. By land area, Kainuu is twice as large as Uusimaa, but Uusimaa has 22 times the population. As Table 2 shows, Central Ostrobothnia would also be left with just 14 producers, but the region is much smaller than Kainuu, and more densely populated. Figure 3 illustrates the differences between regions and municipalities. Each region has municipalities that are prone to monopolies, as well as areas suitable for perfect competition. A comparison of Figures 3a and 3b reveals problem areas that have a higher risk of being left under a monopoly, or even without a producer.

If the capitation payment were just 120 euros, the customer requirement for 2-million-euro turnover would be 16 667 patients. This increases the number of municipalities that are too small for a producer. With low capitation, private producers can only operate the large centres required in the most populous municipalities and cities of Finland. Under this capacity requirement, only five municipalities would be able to host more than 10 producers (Helsinki 38, Espoo 16, Tampere 14, Vantaa 13, Oulu 12, Turku 11). Over 31 % of Finnish municipalities would only have one or two producers in their area. These would mainly be small municipalities in Uusimaa and in Southwest Finland. 178 municipalities (60 % of municipalities and 13 % of the Finnish population) would be completely cut off from private healthcare services. On regional level, Central Ostrobothnia would host just four private healthcare centres, and Kainuu another four – for their entire population (Table 2).

For a municipality with a large population, creating a comprehensive production network is not going to be a problem. Even when producers require a 2 million euro turnover and capitation is set at 300 euros (i.e., capacity: 6 667), Uusimaa, Southwest Finland, and Pirkanmaa can still create comprehensive production networks. On municipal level, Espoo, Helsinki, Hämeenlinna, Joensuu, Jyväskylä, Kouvola Kuopio, Lahti, Lappeenranta, Oulu, Pori, Tampere, Turku, Vaasa, and Vantaa are able to maintain structures of over ten producers. If the capitation is lower, 200 euros, the capacity need increases to 10 000 patients and there will be just nine municipalities with over ten producers left (Espoo, Helsinki, Jyväskylä, Kuopio, Lahti, Oulu, Tampere, Turku, Vantaa, with a total of 38.6 %

of the population). 27 municipalities (with 25 % of the population) are capable of hosting from three to nine producers.

Table 2. Expected numbers of healthcare centres by region and producer capacity.

	Capacity				
	2 500	5 000	6 667	10 000	16 667
Uusimaa	655	328	246	164	98
Southwest Finland	190	95	71	48	29
Satakunta	89	44	33	22	13
Tavastia Proper	70	35	26	17	10
Pirkanmaa	204	102	76	51	31
Päijänne Tavastia	81	40	30	20	12
Kymenlaakso	71	36	27	18	11
South Karelia	52	26	20	13	8
Southern Savonia	60	30	22	15	9
Northern Savonia	99	50	37	25	15
North Karelia	66	33	25	16	10
Central Finland	110	55	41	28	17
Southern Ostrobothnia	77	38	29	19	12
Ostrobothnia	73	36	27	18	11
Central Ostrobothnia	28	14	10	7	4
Northern Ostrobothnia	164	82	62	41	25
Kainuu	30	15	11	7	4
Lapland	72	36	27	18	11

Most regions have at least one municipality in which competition between large producers is possible even with a low capitation (Table 3). In the regions of Uusimaa, Southwest Finland, Pirkanmaa, and Northern Ostrobothnia, there are, on average, several municipalities facilitating competition between large producers (turnovers of over 2 million euros). Tables 2 and 3 can be analysed by comparing the numbers of producers in the region and the potential municipality-level market structure outcomes within the region. For example, the number of producers with a capacity of 16 667 in South Karelia is eight (see Table 2), and these are mostly concentrated in one municipality (see Table 3). In Central Finland, the 110 producers with a capacity of 2 500 are scattered in 15 municipalities. Six of the municipalities end up with a monopoly, and another two with an oligopoly. In many regions, small capacity results in a producer network that is at densest in under 50 % of the region's municipalities, while a large capacity usually yields just one municipality with a dense producer network.

Since Table 2 lists the numbers of producers for the whole region and outcomes in Table 3 are based on municipal division, there can be differences in the totals for the regions (e.g., municipalities inclined to yield an oligopoly with capacity of 16 667 in Central Ostrobothnia and Kainuu). In most cases, most of the producers are located in municipalities marked as competition or oligopoly, but Table 2 also allows, in most cases, one or two multi-municipal healthcare centres. The data in Table 3 is not suitable for comparisons between regions due to differences in population, population density, and number of municipalities.

In Uusimaa, competition between large producers with a capacity of 16 667 is possible in four municipalities. Healthcare centres with a capacity of 5 000 patients (or under) would be optimal for ten municipalities. Three municipalities are in risk of remaining without producers unless they accept a small healthcare centre with just a few doctors. Even in this case, a monopoly would be the most obvious outcome. In the region of Southwest Finland, competition between large producers is possible in 2–3 municipalities, while a small 2 500 patient production capacity is best suited for most municipalities.

In the regions of Satakunta, Tavastia Proper, Pirkanmaa, Päijänne Tavastia, South Karelia, Southern Savonia, Northern Savonia, North Karelia, Southern Ostrobothnia, and Ostrobothnia, only 1–2 municipalities can host competition between large producers. Small producer size is suitable for 2–5 municipalities, and 5–7 municipalities are under threat of being left without any producers. 11 out of 14 Southern Savonian and 15 out of 19 Northern Savonian municipalities are only suited for competition between small producers. Additionally, small-scale production is the best option for most municipalities of Central Finland and Northern Ostrobothnia. In Kymenlaakso, medium-sized producers with patient capacities of 5 000–10 000 are suitable for approximately one half of municipalities, while only small producers are applicable for the other half. Of the municipalities of Kainuu and Lapland, 1–2 can host competition among large producers. Other municipalities are suitable as market areas for a small or a very small producer. In these regions, competition will be scarce, apart from one or two municipalities.

Table 3. Numbers of municipalities with different market structures, by region, under various producer capacity assumptions.

	Capacity				
	2 500	5 000	6 667	10 000	16 667
Uusimaa (26 municipalities)					
0	2	3	7	10	11
monopoly	1	7	3	2	4
oligopoly	4	0	2	3	7
competition	19	16	14	11	4
Southwest Finland (27 municipalities)					
0	7	10	11	17	21
monopoly	3	7	7	6	4
oligopoly	2	1	5	1	0
competition	15	9	4	3	2
Satakunta (18 municipalities)					
0	5	7	9	12	16
monopoly	2	5	7	4	0
oligopoly	5	4	0	0	1
competition	6	2	2	2	1
Tavastia Proper (11 municipalities)					
0	2	2	4	7	7
monopoly	0	5	3	2	3
oligopoly	2	0	2	1	0
competition	7	4	2	1	1
Pirkanmaa (22 municipalities)					
0	2	6	7	11	13
monopoly	4	5	6	4	8
oligopoly	4	2	2	3	0
competition	12	9	7	4	1
Päijänne Tavastia (9 municipalities)					
0	0	4	4	5	6
monopoly	4	1	1	2	2
oligopoly	0	0	2	1	0
competition	5	4	2	1	1
Kymenlaakso (7 municipalities)					
0	1	2	3	4	4
monopoly	1	2	1	0	1
oligopoly	2	0	0	1	0
competition	3	3	3	2	2
South Karelia (9 municipalities)					
0	0	5	7	7	7
monopoly	5	2	0	0	1
oligopoly	2	0	0	1	0
competition	2	2	2	1	1
Southern Savonia (14 municipalities)					
0	4	7	11	11	11
monopoly	3	4	0	1	1
oligopoly	4	0	1	0	1
competition	3	3	2	2	1

	Capacity				
	2 500	5 000	6 667	10 000	16 667
Northern Savonia (19 municipalities)					
0	4	11	11	15	15
monopoly	7	4	4	0	3
oligopoly	1	0	0	3	0
competition	7	4	4	1	1
North Karelia (13 municipalities)					
0	2	5	6	8	12
monopoly	3	3	5	4	0
oligopoly	2	4	1	0	0
competition	6	1	1	1	1
Central Finland (23 municipalities)					
0	8	14	16	19	19
monopoly	6	5	3	2	3
oligopoly	2	0	2	1	0
competition	7	4	2	1	1
Southern Ostrobothnia (17 municipalities)					
0	3	7	9	10	15
monopoly	4	3	3	5	1
oligopoly	2	4	3	1	0
competition	8	3	2	1	1
Ostrobothnia (15 municipalities)					
0	2	3	6	11	12
monopoly	1	8	6	3	2
oligopoly	5	1	2	0	0
competition	7	3	1	1	1
Central Ostrobothnia (8 municipalities)					
0	2	6	7	7	7
monopoly	4	1	0	0	0
oligopoly	1	0	0	0	1
competition	1	1	1	1	0
Northern Ostrobothnia (30 municipalities)					
0	4	11	15	22	27
monopoly	7	12	10	6	2
oligopoly	7	2	3	1	0
competition	12	5	2	1	1
Kainuu (8 municipalities)					
0	2	4	4	6	7
monopoly	2	2	3	1	0
oligopoly	0	1	0	0	1
competition	4	1	1	1	0
Lapland (21 municipalities)					
0	5	13	14	18	18
monopoly	8	5	4	0	2
oligopoly	2	0	0	2	0
competition	6	3	3	1	1

6.3. Problem Areas

In Finland, there appear to be about ten large municipalities that are small in population (located in Lapland and Kainuu), where monopoly seems to be an inevitable solution. In other words, if residents only use healthcare services provided in their own municipality, some of them have an unreasonably long journey to the service provider. Since municipal boundaries are not an obstacle to the provision or reception of a service, producers can also receive customers from neighbouring municipalities. As the healthcare market is largely local, regional monopolies are, in spite of this, almost inevitable. Even though the population of Lapland is high, it is partly fragmented and, as a result, population density is low. Sparsely populated areas are more suitable for smaller health centres.

Thus far, clear limits on the size of the producers have not been set for the social and health care reform. As Tables 2 and 3 showed, capacity influences the selection from which consumers are able to make their choice. In small and low-density municipalities and regions, consumers' freedom of choice could be improved by creating one man's practices. This type of production could be made possible, for example, through a municipal healthcare centre where doctors work as entrepreneurs, i.e., not employed by the municipality. This practice would be in line with the Italian group practices. Alternatively, competition in sparsely populated areas could be increased by implementing a model from Norway and Denmark, i.e., the one man's practice. With a low capitation of 200 euros, a number of small medical centres with fewer than five doctors (turnover of 500 000 euros) would yield a more optimal outcome than one high-capacity centre. A capacity of 2 500 would allow Lapland, Kainuu, Central Ostrobothnia, South Karelia, and Southern Savonia more versatile production networks. However, even though Lapland then would get 72 small healthcare centres, they would be located in the central and southwest sides of the region, leaving the northern and eastern parts without a producer (see Figure 3a). In total, 55 municipalities would still be too small to host a healthcare provider for their residents. This means that circa 1.8 % of the population would be left without private services, and about 4.2 % of the population would live under a monopoly. Producers could also offer ambulatory services to take care of larger multi-municipal areas. For example, the northern part of Central Finland and the southern part of Central Ostrobothnia form a joint area of monopoly producers and no producers at all. For such an area, the solution could be either to have self-employed doctors, or a few small-sized healthcare centres, that would provide ambulatory medical services to avoid excessive travel for consumers.

7. Discussion

Current public purchases from the private sector are highest in larger municipalities, and decrease when smaller, sparsely populated areas are being observed (TEM 2018). The most expensive procurements of products and services (excluding construction works, medicine procurements, training, dental care, and psychiatry) were made in the regions of Southwest Finland, Northern Ostrobothnia, Pirkanmaa, Southern Ostrobothnia and Uusimaa. The smallest amounts of purchases were made in South Karelia, Kainuu, Central Ostrobothnia, Northern Savonia, and Päijänne Tavastia. In financial terms, the largest service procurements were made in Uusimaa, Pirkanmaa, and Southwest Finland. This could mean that there are some production problems in these regions, perhaps problems in getting enough doctors. However, according to the Finnish Medical Association (Lääkäriliitto 2018), the worst shortage of doctors is in the regions of Kainuu (17 %) and Southern Savonia (ranging from 11.7 % to 13.5 %). The largest numbers of unfilled posts are in the regions of Pirkanmaa and Southwest Finland, though (approx. 360 positions). Typically, this deficiency is corrected by using substitutes, i.e., either by purchasing the service from the private sector, or by outsourcing the service to a private producer.

According to the publication of the National Institute for Health and Welfare, public purchases of primary healthcare services from the private sector have varied between 210 and 237 million euros in value in the 2010s (THL 2017). By turnover, the shares of the two largest healthcare providers in the production of public services are significant even before the opening of the market. The annual report of Terveystalo (TT vuosikertomus 2017) shows that public sector customers generated an income of 63.6 million euros, or nearly 10 % of the company's net sales. Mehiläinen (2016) does not directly report its public-sector incomes, but its healthcare centre locations show that the company strongly avoids Eastern Finland, Upper Lapland, and (with the exception of a few municipalities) Western Finland. Presumably, these agreements could give a great advantage in the negotiations for the provision of future healthcare services.

In smaller municipalities and sparsely populated areas, private producers could receive a cost advantage (by lowering their costs) by providing the services through a network model, like Terveystalo currently does (TT vuosikertomus 2018). This means that customers could get quick routine check-ups and basic services even in smaller

municipalities, but for more demanding services they would be guided to a larger medical centre. In this way, the company is able to provide a comprehensive network of operations that is also cost-effective as the risk of overcapacity is reduced. A producer can reduce its fixed production costs when a part of its production is concentrated in larger health centres.

The network model creates apparent choices as the producer selection can, in this way, be large even in small municipalities. However, if customers do not know beforehand that they may be required to travel to gain access to some of the health services, the company that creates the seemingly most comprehensive network becomes the strongest. If customers know that they will not get all healthcare services locally, this is likely to have an effect on their choice. In this case, it would be most advantageous for the consumer to choose a company that is a little farther away but has a more comprehensive service offering, and thereby potentially provides a better quality service (see Bloom et al. 2015).

High population density ensures that the consumer has a short distance to the producer. The producer networks of big cities are more comprehensive, and it can well be assumed that this will continue to be the case also after the opening of the market, just like in other European countries. The market opening may push some producers closer to major centres, leaving the surrounding districts for less attention, though. The risk areas are small municipalities surrounding big cities in the southern and western Finland. In these areas, residents' travel time to the health centre can be expected to increase. Small municipalities with small populations in the south and the west of the country cannot potentially have their own health centre. Their residents are presumably going to be divided between the nearest health centres of the neighbouring municipalities.

The capitation payment alone does not cover all cost. Of the 297 municipalities, only 77 have per capita primary care costs of under 600 euros/year, and only in 27 municipalities are the per capita primary costs under 500 euros/year (Tilastokeskus 2017). The data of Statistics Finland (Tilastokeskus 2017) shows that the average per capita cost of primary healthcare is 775 euros but this varies greatly by municipality. Using the formula (Vuorensola 2018)

$$\frac{\frac{\text{production costs}}{\text{customer (social security no.)}} + \text{hidden value added tax}}{12 \text{ months}} = \text{capitation €/month}$$

and considering all production costs recorded by Statistics Finland (Tilastokeskus 2017), capitation should be around 68.7 euros per month, or about 800 euros a year. These primary healthcare costs alone are 60–80 % higher than the capitation used in the freedom of choice experiment. This means that the producer must also have other income in addition to capitation to maintain its business. The extent to which a producer needs additional income depends on which services are kept under public healthcare and which can be freely priced by the producer. Additionally, the net sales of the producer are also influenced by

- the need for specialised services, and their demand,
- which healthcare services are being offered by the providers,
- whether the municipality uses fee-for-service compensation, and the amounts, and
- the capitation amount.

Population characteristics create pressures on maintaining the costs on a decent level. These do not directly explain healthcare costs since a municipality can arrange services in different ways, or use a different kind of mixture of services in different areas – conditions for the provision of services vary. The very high costs of northern Lapland, for example, can well be attributed to the lack of service, which, in turn, is caused by the fact that population there is extremely decentralised. In municipalities with several larger centres, a different kind of service structure is required than in municipalities that only have one densely populated centre, or do not have a centre at all. Public consumption is also affected by the use of substitute services. If consumers use occupational health services or favour private services more (access to care is more important than price), this will ease the burden on public production.

Setting a size floor for producers, i.e., allowing only x-sized companies on the market, would restrict consumer choice, reduce competition between small producers, and weaken the distribution of production. How the capacity of different producers improves or undercuts consumer choice is most noticeable in small, sparsely populated municipalities. A large capitation maintains, and encourages the creation of, large companies and health centres. On the other hand, if capitation is low, it is possible that only large and medium-sized companies will be able to operate on densely populated markets due to the cost

advantage given by the economies of scale. This could then mean that sparsely populated areas would be left for smaller producers and their local monopolies.

Small producers could benefit from digitalisation in their patient work. This could be accomplished, for instance, in such a way that the local doctor performs the basic services, e.g., takes samples from a customer and then delivers the material to a larger medical centre for analysis. The risk with self-employed doctors is in the continuity of production, as the production of the service relies on a single person. Production should be guaranteed even when the doctor is prevented from providing the services, or if there is a problem with labour mobility in the area. This has also been an issue in Norway and Denmark, but production can be secured, to a certain extent, by providing financial incentives for producers. A fragmented production network may increase problems with control: Producers can offer more times to their seldom-visiting customers and only offer times that are weeks away for their more service-intensive customers. Producers are thus able to engage in cream skimming.

The greatest limitation of this thesis is the lack of existing data. Since the reform has not taken place yet, there is no reliable material on the evolution of the market. Secondly, as the market is constantly changing, no definite results can be determined. The healthcare reform is expected to increase the demand and consumption of healthcare services, as has happened in other European countries. Finland's aging population will also contribute to this. As a result, it can be expected that the need for nurses and doctors, and thus the demand for labour, will increase. The increase in the number of personnel improves the availability of care, but with increasing need for care it is difficult to predict in what direction the total availability and accessibility will advance. It is also impossible to say to what extent new companies will be introduced to the market, what direction the production of the existing companies will take, and what the role of public production after the market opening will be.

It is empirically difficult to measure the impact of the general healthcare policies set by the regions and to determine the impact of these on the market. The regional rules not only affect the existing markets of the regions, but also have an impact on the entry of companies. Other barriers to entry include the region's population structure, the estimated population development, and the existing production environment. It is not possible to

assign reliable weights to each variable affecting the barriers. In addition, since each region can decide on its reimbursement system all by itself, it is not possible to reliably predict what the market outcome in each municipality or region will be. The greatest challenge is the current opacity of the rules of the healthcare reform. The goal is to move liabilities to municipalities, though, which is why the result can be very complex, and, at worst, even more inefficient than prior to the reform.

8. Conclusion

This thesis examines competition in the healthcare and, more specifically, how the opening of the markets affects customers' choice. The focal point has been the Finnish healthcare reform that is currently under construction. The healthcare reform aims to increase competition and improve access to care through the consumers' freedom of choice. The preparation of the reform has not been without problems as there is no one solution that could be optimal for consumers, companies, and the government at the same time. Economic models do not provide simple and easy solutions for setting up efficient healthcare markets.

Over the past few years, Europe has shifted away from traditional government-provided healthcare. The problem with public healthcare is its high costs, slow responsiveness to customers' needs, and poor access to care. Finland, led by many European countries, has come to seek help from market mechanisms. With these market mechanisms it is aspired to introduce more customer-centred healthcare and increase the number of alternative providers, which is expected to improve cost-effectiveness and access. The switch to private production, however, is not straightforward. The differences of municipalities and regions (most importantly, population structures and population densities), set varying requirements for organising the healthcare. Regional characteristics have an important impact on the transformation of the producer structure. In sparsely populated areas, the market structure favours local monopolies. This might increase market concentration or, alternatively, produce fragmented and inefficiently small markets. Major cities favour larger producers but do not preclude the entry of small producers.

The compensation scheme will largely guide the formation of the producer network for each municipality and region. The lack of competition and setting up a comprehensive production network will inevitably be problematic. Distances are long in sparsely populated areas but travelling times might also lengthen in areas surrounding larger cities. Naturally, the distribution of producers will have an effect on customers' access to care. It is, however, impossible to predict how the implementation of the freedom of choice is going to be received on the consumer side.

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